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Electric Melting in Non-Ferrous Industry

Present Status in the United States—Furnaces Sold Total 261—The Various Types, Their Location and Product

BY EDWIN F. CONE

IN the last few years there has been a phenomenal expansion in the use of electric furnaces as a melting medium in the brass and non-ferrous industry of the United States. They are gradually displacing the crucible and other processes for this purpose. Realizing that this expansion was of large proportions, THE IRON AGE was prompted to attempt the inauguration of a compilation of the status of this industry from the statistical point of view as regards the number and type of furnaces in use, similar to the annual review of the electric furnace steel industry published in the annual review issue each January. The following is therefore a summary of the electric non-ferrous industry, giving tables of the installations by companies of all the types of electric furnaces, their product and size, and, in one case, other data.

THE results of the compilation of these data bring out the striking fact that in the United States there are 261 electric furnaces of all types operating or contracted for as of March 1. While the majority are employed in melting brass, other non-ferrous metals and alloys are included.

There are three prominent types of furnaces which thus far have assumed the commanding position. They are in point of superiority of installations: The Ajax-Wyatt, the Baily and the Detroit, with 118, 61 and 44 furnaces sold respectively. The pioneer among these in this industry is probably the Baily, invented and perfected by T. F. Baily, president Electric Furnace Co., Alliance, Ohio. One of the first of these furnaces was described in THE IRON AGE, Feb. 1, 1917, as operating on bearing metal at the Lumen Bearing Co., Buffalo, N. Y. A feature of the Baily installations is the diversity of products. This furnace is operating not only in the yellow and red brass field, but also in the aluminum. It is used in one electrolytic zinc plant and also in casting phosphor bronze for automobile parts. It is also operating on silver for dinner-ware.

Table of Baily Electric Furnaces Operating or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1920, as Sold by the Electric Furnace Co., Alliance, Ohio.

Company and Location	Number of Furnaces	Style	Capacity of Each in K.W.	24-Hr. Capacity of Each in Tons	Total K.W. Rating	Total Daily Tonnage	Product
Wm. A. Rogers, Ltd., Buffalo, N. Y.	1	Pit crucible	40	1½	40	1½	Silver for dinner ware
Lumen Bearing Co., Buffalo, N. Y.	3	Tilting	105	8	315	24	Yellow brass, lumen manganese bronze for bearings
Baltimore Copper Smelting Co., Baltimore, Md.	1	Tilting	105	8	105	8	Yellow brass ingot
Hays Mfg. Co., Erie, Pa.	1	Tilting	105	8	105	8	Yellow brass for plumbing goods
Aluminum Co. of America, Massena, N. Y.	1	Rectangular	500	24	500	24	Refining aluminum
Anaconda Copper Mining Co., Butte, Mont.	1	Tilting	105	8	1105	208	Yellow brass
Anaconda Copper Mining Co., Butte, Mont.	1	Rectangular pusher	1000	200	....	....	Casting electrolytic zinc
Penberthy Injector Co., Detroit, Mich.	1	Tilting	105	8	105	8	Yellow brass for valves and injectors
Standard Sanitary Mfg. Co., Louisville, Ky.	5	Tilting	105	8	525	40	Yellow brass for plumbing goods, also manganese bronze
Michigan Smelting & Refining Co., Detroit, Mich.	5	Tilting	105	8	525	40	Yellow brass ingot and rolling mill slabs
McRae Roberts Co., Detroit, Mich.	3	Tilting	105	8	315	24	Yellow brass for automobile parts
Buick Motor Co., Flint, Mich.	2	Tilting	105	8	210	16	Phosphor bronze for automobile parts
Electric Furnace Co., Salem, Ohio	5	Tilting	50 and 105	....	375	26	Test runs on brass, bronze, zinc and aluminum
Capitol Brass Co., Detroit, Mich.	2	Tilting	105	8	210	16	Yellow brass for valves and fittings
Akron Bronze & Aluminum Co., Akron, Ohio	2	Rectangular tilting	50 and 105	2 and 8	155	10	Yellow brass, red brass, gunmetal and aluminum
Nolte Brass Co., Springfield, Ohio	1	Tilting	105	8	105	8	Yellow brass for valves and fittings
Kennedy Valve Co., Elmira, N. Y.	2	Tilting	105	8	210	16	Red brass for valves
U. S. Navy, Washington, D. C.	1	Tilting	105	8	105	8	Yellow brass
Dayton Engineering Laboratories, Dayton, Ohio	1	Tilting	105	8	105	5	Aluminum for Delco products
Drew Electric & Mfg. Co., Cleveland, Ohio	1	Tilting	105	8	105	8	Yellow brass
American Bronze Corporation, New York City	2	Tilting	105	8	210	16	Bronze
Deming Co., Salem, Ohio	1	Rectangular tilting	50	2	50	2	Yellow brass for valves
Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.	1	Rectangular tilting	50	2	50	2	Yellow brass
Landers, Frary & Clark, New Britain, Conn.	1	Rectangular tilting	50	1½	50	1½	Aluminum
Miller Pasteurizing Machine Co., Canton, Ohio	1	Rectangular tilting	50	2	50	2	Yellow brass
Wh[illegible]thers, Philadelphia, Pa.	1	Tilting	105	8	105	8	Yellow and red brass
Union Brass & Metals Mfg. Co., St. Paul, Minn.	1	Tilting	105	8	105	8	Red brass
American Hardware Corporation, New Britain, Conn.	1	Tilting	105	8	105	8	Red brass
Acheson Mfg. Co., Rankin, Pa.	1	Tilting	105	8	105	8	Yellow brass
Utica Valve & Fixture Co., Utica, N. Y.	1	Tilting	105	8	105	8	Yellow brass
Parish Pool Co., Cleveland, Ohio	1	Motor-nose tilting	105	8	105	8	Yellow brass
West Virginia Metals Products Co., Fairmount, W. Va.	2	Motor-nose tilting	105	8	210	16	Yellow brass
U. S. Copper Products Co., Cleveland, Ohio	1	Motor-nose tilting	105	8	105	8	Yellow brass
Kayline Co., Cleveland, Ohio	1	Hand tilting	50	2	50	2	Yellow brass
Atlas Brass Works, Columbus, Ohio	1	Tilting	105	8	105	8	Yellow Brass
Detroit Brass Works, Detroit, Mich.	3	Tilting	105	8	315	24	Yellow brass
McKenna Brass Works, Pittsburgh	1	Tilting	50	2	50	2	Yellow brass
Total	61						

Mitsui & Co., Japan, have purchased one 105 k.w. furnace for melting yellow brass; its capacity is 8 tons per 24 hours.
G. Amsinck Co., Mexico City, Mexico, has purchased one 105 k.w. furnace for melting yellow brass; its capacity is 8 tons per 24 hours.
The Dominion Steel Products Co., Bradford, Ont., Canada, is credited with one 50 k.w. 2-ton furnace for melting yellow brass.

Table of Ajax-Wyatt Electric Furnaces, Operating or Contracted for in the Non-Ferrous Industry, in the United States on March 1, 1920, as Sold by the Ajax Metal Co., Philadelphia

Company and Location	Number of Furnaces	Product
American Brass Co., Waterbury, Conn.	16	Yellow brass rolled products
American Brass Co., Kenosha, Wis.	24	Yellow brass rolled products
Bridgeport Brass Corporation, Bridgeport, Conn.	24	Yellow brass rolled products
National Conduit & Cable Co., Hastings-on-Hudson, N. Y.	6	Yellow brass rolled products
Washington Navy Yard, Washington, D. C.	2	Yellow brass rolled products
Buick Motor Co., Flint, Mich.	1	Brass castings
Waclack Wire Co., Elizabeth, N. J.	1	Yellow brass rolled products
West Virginia Metal Products Co., Fairmount, W. Va.	6	Yellow brass rolled products
Chase Metal Works, Waterbury, Conn.	31	Yellow brass rolled products
Scovill Mfg. Co., Waterbury, Conn.	1	Yellow brass rolled products
Standard Underground Cable Co., Pittsburgh	2	Yellow brass rolled products
Rome Brass & Copper Co., Rome, N. Y.	1	Yellow brass rolled products
General Electric Co., Pittsfield, Mass.	1	Yellow brass rolled products
Corbin Cabinet Lock Co., New Britain, Conn.	1	Brass and bronze castings
Parish Pool Co., Cleveland	1	Yellow brass rolled products
Total	118	

One furnace has been exported to France.

The first Baily furnace installed in this industry was in 1914 at the plant of William A. Rogers, Ltd., Buffalo, where it is still in use for melting silver for dinnerware. The next was in 1916 at the Lumen Bearing Co.'s plant. In 1917 five were sold, and in 1918 the records show 12 sold. The Electric Furnace Co. states that its total sales involve 7395 kw. of electrical capacity and 650 tons daily melting capacity.

The Ajax-Wyatt furnace, sold by the Ajax Metal Co., Philadelphia, is operating largely in the brass industry, particularly in wrought brass. Two plants are operating 24 of these furnaces each, and another 31, and a fourth 16. Of the 118 installations only two are scheduled for foundry work, the remainder for furnishing metal for rolled products.

Table of Detroit Rocking Electric Furnaces Operating or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1920, as Sold by the Detroit Electric Furnace Co., Detroit, Mich.

Company and Location	No. of Furnaces	Size, Lb.	Product
Aluminum Castings Co., Detroit, Mich.	2	2000	Bronze castings
Chas. B. Bohn Foundry Co., Detroit, Mich.	5	2000	Brass, bronze and aluminum castings
Bridgeport Brass Co., Bridgeport, Conn.	1	2000	Bronze billets
Chase Metal Works, Waterbury, Conn.	4	2000	Yellow brass billets
Cleveland Brass & Copper Rolling Mills, Cleveland	1	2000	Yellow brass billets
Detroit Copper & Brass Rolling Mills, Detroit, Mich.	4	2000	Yellow brass billets
Ford Motor Co., Highland Park, Mich.	1	2000	Brass and bronze castings
Ford & Son, Dearborn, Mich.	1	2000	Brass and grey iron castings
General Aluminum & Brass Mfg. Co., Detroit, Mich.	2	2000	Brass castings
General American Tank Car Corporation, East Chicago, Ind.	1	1000	Brass castings
Hills-McCanna Co., Chicago	1	500	Brass castings
Michigan Lubricator Co., Detroit, Mich.	2	2000	Brass castings
Michigan Smelting & Refining Co., Detroit, Mich.	4	2000	Composition ingots
Mueller Metal Co., Port Huron, Mich.	1	2000	Yellow brass billets
Oregon Brass Works, Portland, Ore.	1	2000	Brass and bronze castings
[illegible]	1	1000	
Parish, Pool & Co., Cleveland, Ohio	3	2000	Composition ingots
Pressed Metals Co., Marysville, Mich.	2	2000	Bronze castings
Rome Wire Works, Rome, N. Y.	1	2000	Bronze and copper billets
Sherwood Brass Works, Detroit, Mich.	3	2000	Brass and bronze castings
Wheeler Condenser & Engineering Co., Carteret, N. J.	1	2000	Yellow brass billets
White & Brother, Philadelphia	1	2000	Composition ingots
M. Smolensky Mfg. Co., Cleveland	1	500	Melting red brass
Total	44		

The Detroit furnace is also called the Detroit Rocking furnace, and at the present time is the only one licensed under the United States Bureau of Mines patents for sale and use in the United States, although it was originally called the Gillett furnace. It is a comparatively recent entrant into this field and with its 44 installations has made remarkable progress. This furnace is also being used in one case in the steel industry, a one-ton unit being in operation on steel castings at the Michigan Steel Castings Co., Detroit, Mich.

The Booth rotating furnace is one of the most recent, and it is credited with 20 installations for operations on brass, the sizes ranging from one-eighth to one ton capacity each. The names of the companies are not yet divulged. The 20 furnaces comprise three of 1-ton, one of ½-ton, 13 of ¼-ton and three of ⅛-ton capacity. This furnace was described in THE IRON AGE, June 26, 1919. The Booth Electric Furnace Co. also has a furnace which is prominent in the electric steel industry.

Table of Rennerfelt Electric Furnaces Operating or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1920, as Sold by Hamilton & Hansell, New York

Company and Location	No. of Furnaces	Capacity, Lb.	Product
Chicago Metal Bearing Co., Chicago	2	2200	Copper and copper alloys
Gerline Brass Foundry, Kalamazoo, Mich.	1	750	Copper and copper alloys
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.	1	750	Copper and copper alloys
United States Mint, Philadelphia	1	1000	Copper, nickel, silver and alloys
United States Mint, Philadelphia	1	2000	Copper, nickel, silver and alloys
United States Mint, San Francisco, Cal.	1	1000	Copper, nickel, silver and alloys
Acieral Co. of America, Newark, N. J.	1	300	Aluminum alloys
Bauch Machine Tool Co., Springfield, Mass.	1	300	Aluminum alloys
Total	9		

Table of Electric Furnaces Operating or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1920, other than the Ajax-Wyatt, Baily, Detroit and Rennerfelt Types

Company and Location	Number of Furnaces	Capacity, Lb.	Product	Type
Haynes Stellite Co., Kokomo, Ind.	3		Stellite	Snyder
Chicago Bearing Metal Co., Chicago	2		Brass castings	Snyder
Bayonne Castings Co., Bayonne, N. J.	1		Castings	Snyder
H. Lifchits Brass Foundry & Machine Shop, Indianapolis, Ind.	1		Castings	Snyder
York Hardware & Brass Works, Inc., York, Pa.	1	1000	Brass and copper alloys	Weeks
Andes Electric Corporation, Coney Island, N. Y.	1		Tin	Ludlum
Name not given	20		Brass	Booth Rotating
Total	29			

The Booth Electric Furnace Co. also has a furnace which is prominent in the electric steel industry.

An interesting type is the Rennerfelt, which is used in several diversified industries. It is credited with 9 in the strictly non-ferrous industry, melting copper and copper alloys; coinage metals, such as nickel, copper, silver for United States mints, and aluminum alloys. Its wide use in the United States and Canada, and particularly in Europe, in the steel industry, is familiar. It is extensively used in general testing and research work.

Another well-known electric steel furnace, also prominent in the non-ferrous industry, is the Snyder. Of this type there are 7 credited to the non-ferrous industry. They are melting stellite, brass castings and other special alloys.

Summary of Types of Electric Furnaces Operating or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1920

Type of Furnace	Number of Furnaces
Ajax-Wyatt	118
Baily	61
Detroit Rocking	44
Booth Rotating	20
Rennerfelt	9
Snyder	7
Weeks	1
Ludlum	1
Total	261

The Weeks rotating furnace was invented by Charles A. Weeks, of Philadelphia, whose death is just announced. Mr. Weeks has been prominent in non-ferrous melting developments, having built a number of rotating gas and oil furnaces before he brought out the electric, the former furnishing basic ideas for the latter.

The Ludlum furnace, also a well-known steel furnace, is smelting tin from tin ores which is thus far the only inroad of this type into the industry.

Individual tables of the Ajax-Wyatt, Baily, Detroit, and Rennerfelt furnaces are given herewith, together with a general table of the other types. There is also a table showing the number of furnaces of each type.

Distinguishing Lead in Brass and Bronze

Investigation of Alkali Sulphide Method of Etching—Results when Ammonia Is Used

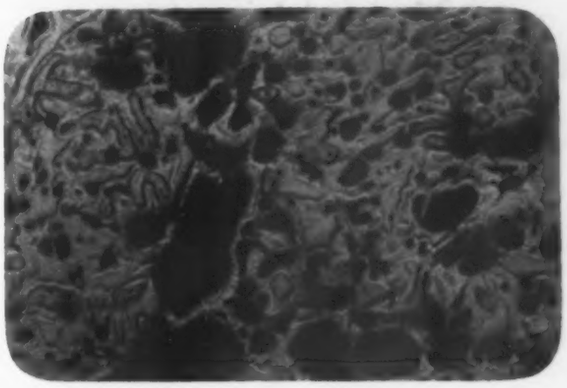
BY F. P. GILLIGAN AND J. J. CURRAN*

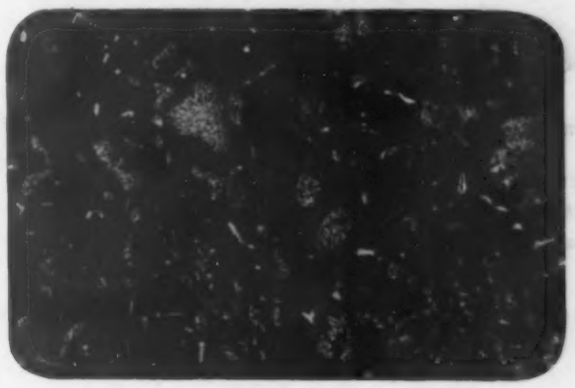
IN THE IRON AGE, Jan. 29, 1919, Prof. O. A. Knight, of Pennsylvania State College, described the etching of bronzes with solutions of alkali sulphides or hydrogen sulphides under the title of "Distinguishing Lead in Brass and Bronze." The author worked on an ingot 4 in. in diameter by 15 in. long, of the following analysis:

	Per Cent
Copper	84.50
Tin	12.50
Lead	3.00

His article is illustrated by two photomicrographs of sections cut from the edge and center respectively of the ingot, near the bottom. Regarding these photomicrographs, he states:

Sulphide solutions employed as etching agents revealed the lead remarkably well. Dilute (10 per cent) solutions of sodium sulphide and potassium sulphide, as well as solutions of hydrogen sulphide, worked equally well. In all instances the copper-tin alloy is acted upon rapidly and darkened to a degree dependent upon the etching time and the strength of the etching solution, while the lead is unattacked and stands out as a very distinct light constituent. This is clearly illustrated in the photomicrographs. Fig. 1 represents the structure of the specimen taken from the outside, while Fig. 2 shows the structure of the specimen taken from the center of the ingot. It will be seen at a glance that the inside has a much higher percentage of lead than the outside, and the manner in which the lead is arranged in a sort of network around the grains is also shown.

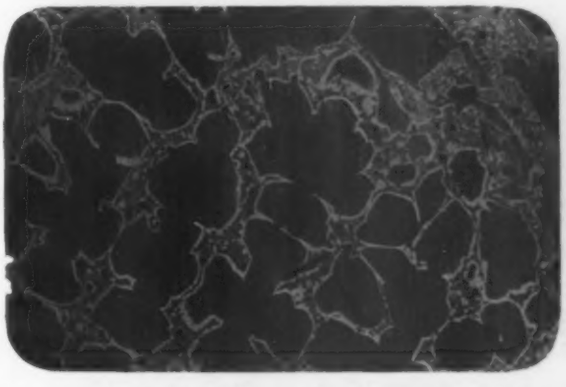


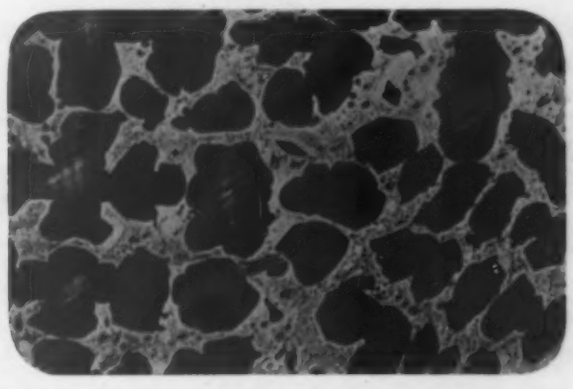


Figs. 1 and 2.—Photomicrographs of Plastic Bronze for Railroad Journal Bearings; Magnification 100 Diameters. Chemical composition is: Copper, 66.88; tin, 5.22; lead, 27.29; zinc, 0.59; nickel, 0.02 per cent with a Brinell (500 kg.) hardness of 41

Fig. 1 (Left) was etched with ammonia. It consists of irregular globules of lead (black) in a matrix consisting of solid solution of tin in copper. The contours of the matrix indicate variations in copper and tin content; the areas bounded by the contour were the first to solidify and contain less tin than the remainder of the matrix

Fig. 2 was etched with sodium sulphide (Na_2S) instead of ammonia; the lead inclusions show up as spongy areas. The small brilliant white areas are $SnCu_4$. The small amount present is traceable to the rather low tin content of the alloy. Because of their small size, they do not appear prominently in Fig. 1, representing the same sample etched with ammonia. The shadowy markings in the matrix indicate variations in composition of the tin-copper solid solution





Figs. 3 and 4.—Photomicrographs of an 88-10-2 Heavy Casting Showing Material Which Liquated to the Surface; Magnification 100 Diameters. Chemical composition is: Copper, 77.10; tin, 18.93; lead, 2.36; iron, 0.01; zinc, 1.54 and nickel, 0.06 per cent

Fig. 3 (Left) was etched with ammonia. It consists of a continuous network of $SnCu_4$ (light constituent with clearly defined structure) in a matrix of solid solution of tin in copper. The round black spots which occur in the $SnCu_4$ are globules of metallic lead

Fig. 4 was etched with sodium sulphide which gives a structure identical with that obtained by etching with ammonia with the exception that the solid solution of tin in copper is stained a deeper hue

Careful study of his photomicrographs, which were reproduced at a magnification of 250 diameters shows that the structure of the bronze consists of inclusions of lead in the form of black globules in a matrix of $SnCu_4$, the latter present as a sharply defined light constituent with eutectoid internal structure; the whole being surrounded by

*The authors are connected with the Henry Souther Engineering Co., Hartford, Conn.

a matrix of alpha bronze or solid solution of tin in copper.

The author's statements that "the lead is unattacked and stands out as a very distinct light constituent" and "the manner in which the lead is arranged in a sort of network around the grains" indicate that he has mistaken the $SnCu_4$ constituent for lead, whereas the lead is really the black globules within the $SnCu_4$ constituent in his own photomicrographs. This point is clearly demonstrated by the accompanying photomicrographs wherein etching with ammonia is compared with the alkaline sulphide etch recommended by Professor Knight.

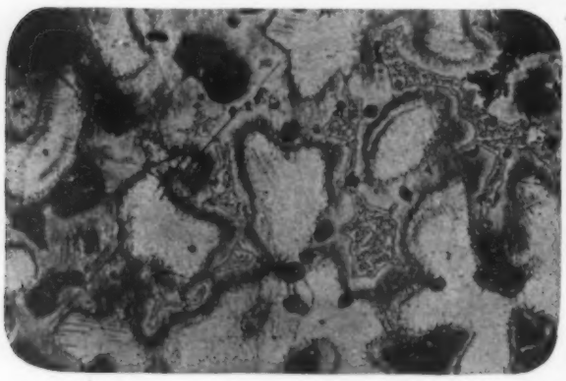
Fig. 2 shows the effect of the alkaline sulphide etch on a specimen of plastic bronze containing 27 per cent lead and a relatively low amount of tin, wherein it will be observed that the white constituent identified by the author as lead is present in very small and infrequent areas; while in Fig. 4, which shows a specimen of high tin bronze, containing less than 3 per cent lead, etched with the same reagent, there are present numerous large white areas of the tin-copper compound, $SnCu_4$.

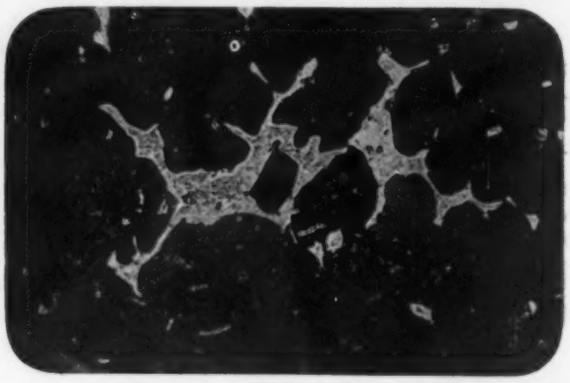
The lead present in the plastic bronze, Fig. 2, is shown as gray globules separate from the $SnCu_4$ compound, whereas in the high tin bronze, Fig. 4, the lead is shown in the globular form within the $SnCu_4$ areas.

Professor Knight calls attention to the variation in depth of the etching of the alpha matrix. His explanation of this phenomenon is logical and correct, as practically all other commonly used reagents produce a similar effect. In the photomicrographs made at this laboratory and here shown the sulphide reagent does not appear to indicate variations in the composition of the matrix as well as our usual ammonia reagent as shown in the comparison views, Figs. 1, 3 and 5.

In conclusion, it is our opinion that these photomicrographs, showing the effect produced by the sulphide etch as compared with the effect produced by the ammonia etch on specimens of widely differing compositions, prove that the only advantage of the sulphide reagent lies in staining the matrix a deep hue so that the $SnCu_4$ stands out more prominently. This effect may be and has been produced by etching the specimen with ammonia and hydrogen peroxide, or with a solution of ferric chloride. A combination of these methods, etching first with ammonia and hydrogen peroxide and then staining with ferric chloride, is also used (Bureau of Standards Technologic Papers Nos. 59 and 60).

As a means of detection of lead it has no advantages, but seems rather unnecessary, as the lead may be best detected in a polished and unetched specimen, as shown in Figs. 7 and 8 submitted herewith, these plates being photomicrographs of the same specimens that are shown in the etched condition in Figs. 1 and 2 and Figs. 5 and 6 respectively.

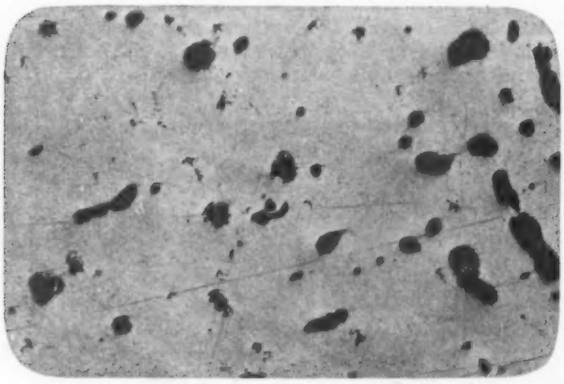




Figs. 5 and 6.—Photomicrographs from a Bronze Casting, Specimen Being Taken Several Inches from the Surface; Magnification 100 Diameters. Chemical composition: Copper, 80.39; tin, 11.25; lead, 6.80, and zinc, 1.56 per cent

Fig. 5 (Left) was etched with ammonia. It consists of areas of $SnCu_4$ (light, sharply defined constituent) and inclusions of lead (black, irregular areas) in a matrix of alpha bronze or solid solution of tin and copper. The shaded contours in the alpha matrix indicate variations in tin and copper content; the lighter areas, which solidified first, are higher in copper content than the half-tone areas, which solidified later

Fig. 6 was etched with sodium sulphide, which does not show the contour effect of varying concentration in the alpha bronze matrix as well, in this case at least, as etching with ammonia. The $SnCu_4$ constituent is sharply defined, while the massive lead inclusions appear as spongy areas rather than as the structureless areas or pits in Fig. 5



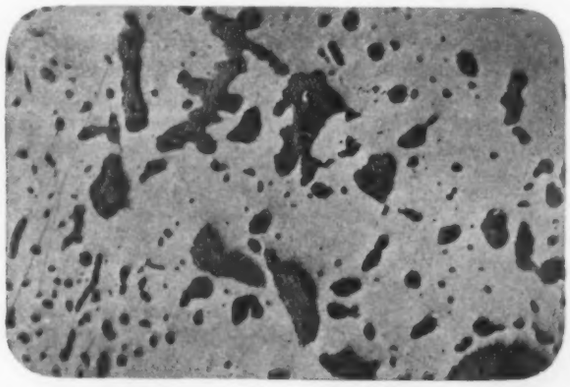


Fig. 7 (Left) Is a Photomicrograph of Plastic Bronze, Magnification 100 Diameters and Has Not Been Etched But Only Polished. Fig. 8 is a photomicrograph from a 500-lb. bronze casting, magnification 100 diameters, and is polished, not etched

These photomicrographs show the appearance of lead inclusions in polished but unetched specimens of the bronzes of different compositions shown by photomicrographs Figs. 1, 2, 5 and 6. The gray areas represent globules of metallic lead

FUEL TROUBLES

Steel Plant Production in the Youngstown District Is Still Seriously Curtailed

YOUNGSTOWN, OHIO, March 2.—Accumulating fuel difficulties culminated in drastic curtailments in steel plant operation at the last of the week, resulting in suspension of the Brown-Bonnell and Bessemer departments of the Republic Iron & Steel Co., two blooming mills and units in the sheet and other finishing departments of the Youngstown Sheet & Tube Co. About 5000 men in the district were temporarily thrown out of employment.

Whereas the daily average of industrial coal is 750 cars, it has varied during the past 10 days from 275 to 400. Normally 80 to 90 cars for domestic purposes are received and this has been reduced to less than 50 per cent. Box car arrivals for last week were estimated at 23 per cent of requirements and gondolas 26 per cent.

An indication of the shortage is the fact that a major producer recently received 27 cars ordinarily used for hauling live-stock. After rebuilding the bottoms and cleaning the interiors, the cars were stocked with finished product and sent to the South. The partially exposed sides were protected by a covering of tar paper.

To secure relief, Federal Fuel Distributor D. T. Murray has appeared on different occasions before the regional committee at Pittsburgh, explaining that enlarged fuel supplies are essential to the maintenance of the Valley's industries.

Heavy shipments of cotton ties are being made to the South from the local mills of the Carnegie Steel Co., which are among the largest producers of this product in the country.

Because of coke scarcity, Alice furnace of the Valley Mould & Iron Co. at Sharpsville, Pa., has been compelled to bank. Stack No. 4 of the Carnegie Steel Co. at Sharon, Pa., has been ready to blow in for some time, after overhauling, but the fires have not been lighted because of irregular fuel supplies.

Bar mills are adversely affected by the coal situation, their steel supply being diminished, and they are able to furnish customers only 70 to 75 per cent orders.

First sheets were rolled March 1 by the new Falcon Steel Co., when four mills at its Niles plant were started. The company enters production at a most auspicious time, with its product in wide demand, and its capacity is booked for several months ahead.

A premium of $35 for a 200-ton lot of cold rolled, pickled and annealed sheets was recently offered by a fabricating interest.

Merchant pig iron producers anticipate scarcity of their product will continue for some time and will be made worse if the railroads come into the market for heavier requirements, as seems likely. Surplus stocks at the furnaces and foundries have dwindled and the makers are crowded with orders. With no letup in demand and the carriers hopelessly unable to make adequate fuel deliveries, there is little expectation locally that there will be a material improvement during the first half. Under such conditions, it is expected prices will advance.

Tariff Bills Move Slowly

WASHINGTON, March 2.—A disposition to sidetrack tariff bills, including those relating to magnesite and tungsten which affect the steel industry, is evident on the part of Republican leaders in the Senate. Reference to this situation was made in the Senate when an effort was made to pass the House bill which as revised by the Senate finance committee, places an embargo on importations of dyes for a period of three years unless held by the tariff commission to be not obtainable in this country on reasonable terms as to price, quality and delivery. Increased tariff rates provided in the bill as passed by the House were struck out by the Senate committee with a view to enlisting the support of Democrats.

Supporters of the straight tariff bills passed by the House helped to make action on the dye bill impossible. Senator Poindexter of Washington, who is especially interested in the magnesite industry in his home state, declared that the dye bill should not be given preference over that relating to magnesite. Senator Smoot of Utah told Senator Poindexter that he believed it to be the wiser policy not to press such bills as those relating to magnesite and tungsten which would in all probability be vetoed by the President if passed. Senator Poindexter retorted that the magnesite producers were willing to take a chance of that and wanted the bill pushed. Senator Poindexter intimated that the Pittsburgh interests which have a large magnesite investment in Austria and which have openly opposed the bill before both House and Senate committees had had something to do with keeping the bill off the floor of the Senate.

The magnesite bill was acted upon favorably by both a subcommittee of the Senate finance committee and by the full committee. Subsequently, however, it was stated that it had been decided to withhold the reporting of the bill to the Senate temporarily. The tungsten bill has been approved by a subcommittee but not by the full committee. O. F. S.

Declared Common Carrier

WASHINGTON, March 2.—In a decision rendered by the Interstate Commerce Commission in the case of the Lackawanna Steel Co. vs. the South Buffalo Railway Co., the latter is found to be a common carrier of property subject to the act to regulate commerce, which may lawfully receive from its trunk line connections compensation out of the through interstate rates to and from points on its line in the form of divisions of joint rates, or of absorptions of its switching charges under appropriate tariff provision, such divisions or absorptions to be just and reasonable.

The Lackawanna Steel Co. controls the South Buffalo through ownership of its shares of stock, and many of its officers are employed by both companies. Passenger service is not performed for the general public, about 95 per cent of the passengers being employees of the Lackawanna, while the remainder are employees of the South Buffalo. More than a dozen independent industries are served by it, and in 1918 there were 164 independent shippers who had neither private sidings nor tracks.

Canadian Plate Mill Starts

The new plate mill of the Dominion Steel Co., Sydney, N. S., has been completed, and active operations have been started. The first plates turned out were, it is claimed, in every particular equal to those made by American mills, and measured up to the highest requirements of Lloyds. The Deputy Minister of Marine, Alexander Johnston, was present when the mill was formally opened. He stated that he believed this undertaking was the beginning of big things for that section of Canada, and that the mill compares favorably with any other similar plant in the world. The mill has a capacity of 100,000 tons of plates per annum, and will employ a large number of men, and is the only one of its kind in the Dominion.

The Merchant Shipbuilding Corporation, Harriman, Pa., has taken a contract for the construction of six steel tankers, each of 12,000 tons rating, to cost about $11,250,000 total. This order assures the yard of continuous operation for about one year after the completion of Government contracts, or until October, 1921. The company has also secured contracts for six additional vessels to be built at its Chester works.

The Whitaker-Glessner Co., Wheeling, W. Va., manufacturer of iron and steel products, corrugated iron specialties, etc., has awarded a contract to the Dravo Contracting Co., Pittsburgh, for the erection of additions to its works at Portsmouth, Ohio, and for improvements in existing buildings at that plant. The work is estimated to cost $120,000.

Delayed Deliveries of Locomotives

WASHINGTON, March 2.—Freight congestion at Danzig has delayed for two months the delivery of 82 Baldwin locomotives, representing more than one-half of the $7,000,000 order placed with the company by the Polish Government. Word of this has just been brought to the Polish Legation by Jan Drozdowski, of Warsaw and New York, who conducted the negotiations with Samuel L. Vauclain, president of the Baldwin Locomotive Works. Mr. Drozdowski has just returned from Poland.

The total order was for 150 locomotives, 68 already having been delivered. The locomotives are standard gage of the big, consolidated freight type. The locomotives turned over to Poland by Germany, under the armistice, were of every type and in bad condition, so that it was impossible to standardize them or have spare parts on hand for repairs, according to Mr. Drozdowski.

A tie-up in railroad communication has been responsible for the inability of Poland to begin cutting and exporting timber and lumber, in which a considerable trade is expected to be developed. These conditions are acting unfavorably against the Polish mark exchange rate. The Polish Government also needs railroad cars in large numbers, but these can be built in Polish factories now in operation. For their supply of steel rails the Poles are looking to plants at Ostrowiec and Warsaw, in their own country. The order for locomotives placed with the Baldwin company was made necessary because the Polish factories have been unable to give any promises of turning out locomotives within a period of four years. The Baldwin company granted a long-term credit in the transaction.

Government Ownership Favored

WASHINGTON, March 2.—Agitation over the sale of the former German passenger ships by the Shipping Board has had the effect of developing more sentiment for continuing Government ownership and control of its ships than previously seemed to exist. With the exception of a few radical groups, including organized labor and the Farmers' National Council, all witnesses who have previously appeared before the Congressional committees have urged the sale of the ships at the earliest possible moment, sacrificing war costs, if necessary, and the upbuilding of a privately owned American merchant marine. The campaign against the sale of the former German passenger vessels to the same interests that necessarily would have to purchase the bulk of the cargo vessels has put the brakes on the whole selling program of the Shipping Board for the time being at least.

The Senate Commerce Committee is just bringing to a close hearings on merchant marine legislation which have been in progress for several weeks. The effect of the agitation over the German ships undoubtedly will be that the bill which may be reported from the committee will be more restrictive in its terms than would otherwise have been the case.

The Supreme Court of the District of Columbia has issued an injunction restraining the sale of the former German passenger vessels, and unless Congress specifically directs their sale, those who have agitated the question would appear to have won.

Would Extend Screw Thread Commission

WASHINGTON, March 2.—The need for the continuance of the National Screw Thread Commission is explained in a report by Representative Vestal of Indiana to the House in support of a resolution extending the life of the commission for a period of two years from March 21. Mr. Vestal said:

"The purpose for which the commission was created was to investigate, formulate, and, after investigation, test and, upon approval, promulgate standards of commercial screw-thread practice. The commission has practically completed its work, which, in the opinion of Director Stratton, is a work of wide and far-reaching effect. A tentative report was prepared three months ago, which has been made accessible to the engineering and manufacturing industries and which has been subjected to the final test of actual use. It appears that the work of the commission is being accepted with satisfaction by the industries concerned, but that in a few instances it has been found by actual practice that slight adjustments or variations in certain particulars of the standards submitted should be made before the report in its final form is promulgated and the life of the commission terminated.

"It is believed that it would be best to keep the commission in existence for the time named, so that it may pass upon any question of adjustment or modification of the proposed standards. The committee agrees to this all the more readily in view of the fact that no expense has been incurred by the commission and that none is contemplated as a consequence of the extension of time."

Locomotives for Sale

WASHINGTON, March 2.—The War Department has placed 200 Capital decapod locomotives on sale. These locomotives were built originally for the Russian Government, but are now in service on American railroads, the gage and coupling devices having been altered to the standards of domestic lines. They are to be sold by informal bids and negotiations. Bids will be received by the Office of Chief of Engineers, War Department, until March 10.

Upon the collapse of the Imperial Russian Government, and during an extreme demand for steam locomotives in 1918, the War Department bought these engines and since January, 1918, they have been in service in the United States. They were built for service on 5-ft. gage track and to strictly Russian standards. They can be altered for operation on either 4-ft. 8½-in. or 5-ft. gage track. They are available for sale for either domestic or export purposes to the highest bidder. The locomotives are of a type making them suitable for operation on railroads having light rails and whose bridge structures do not permit the loads met with in ordinary American practice.

Machine Tools Sold

WASHINGTON, March 2.—The value of the surplus machine tools sold by the War Department up to Feb. 13 was $6,745,535, of which $517,410 worth was sold during the week ended Feb. 13. The total machinery and engineering equipment sold up to Feb. 13 was $5,893,366. The total non-ferrous metals and scrap amounted to $27,838,797. The grand total of all surplus sales was $597,785,536.

The War Department thus far has liquidated 18,570 formal contracts, valued at $1,237,518,000, and 5022 informal contracts valued at $1,106,302,000. There are 3875 contracts remaining to be liquidated.

A group of engineers who have devoted themselves more or less to publicity and advertising have associated themselves as advertising counselors in connection with technical products. They have established the firm as the Advertising Engineers, Inc., with offices at 50 Union Square, New York. Curtis F. Columbia, at one time with the United States Gypsum Co. and later with the New Jersey Zinc Co., will act as Eastern manager, and associated with him are Virgil G. Marani, at one time building commissioner of Cleveland; Victor Hugo Halperin, identified with the General Fireproofing Co., and F. W. Liggett, of the Bell Telephone Co.

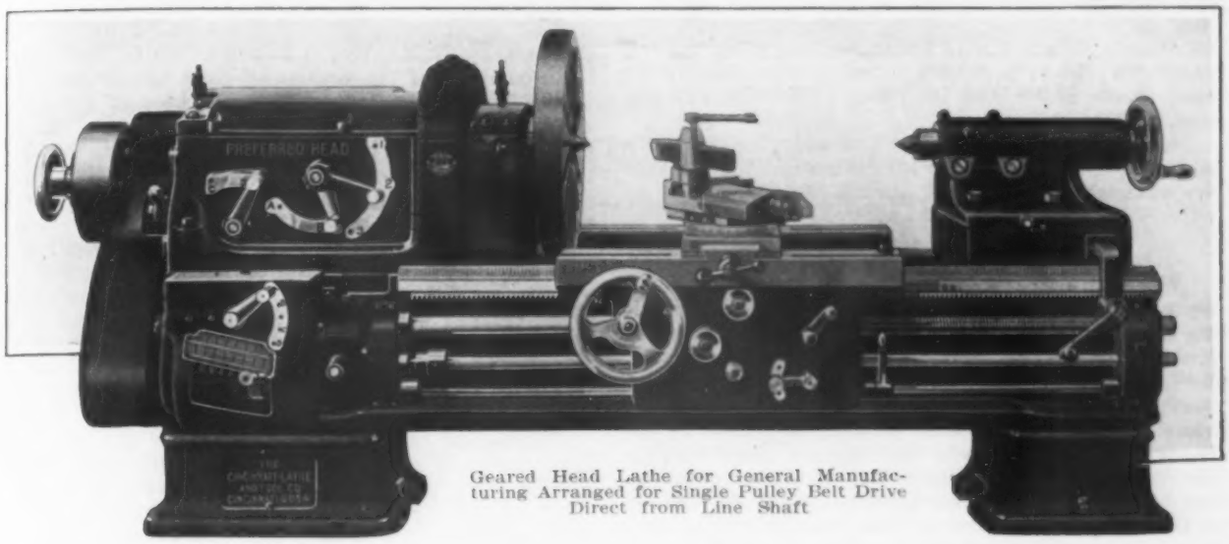
Law and Labor, a monthly periodical on the law of the labor problem, has been inaugurated by the League for Industrial Rights, 175 Broadway, New York. It consists principally of extensive quotations and reviews of Federal and State legislation and court decisions affecting labor.

The housing situation in England and in the United States is discussed in a comprehensive manner by F. T. Miller, president F. W. Dodge Co., 119 West Fortieth Street, New York, in a 30-page booklet.

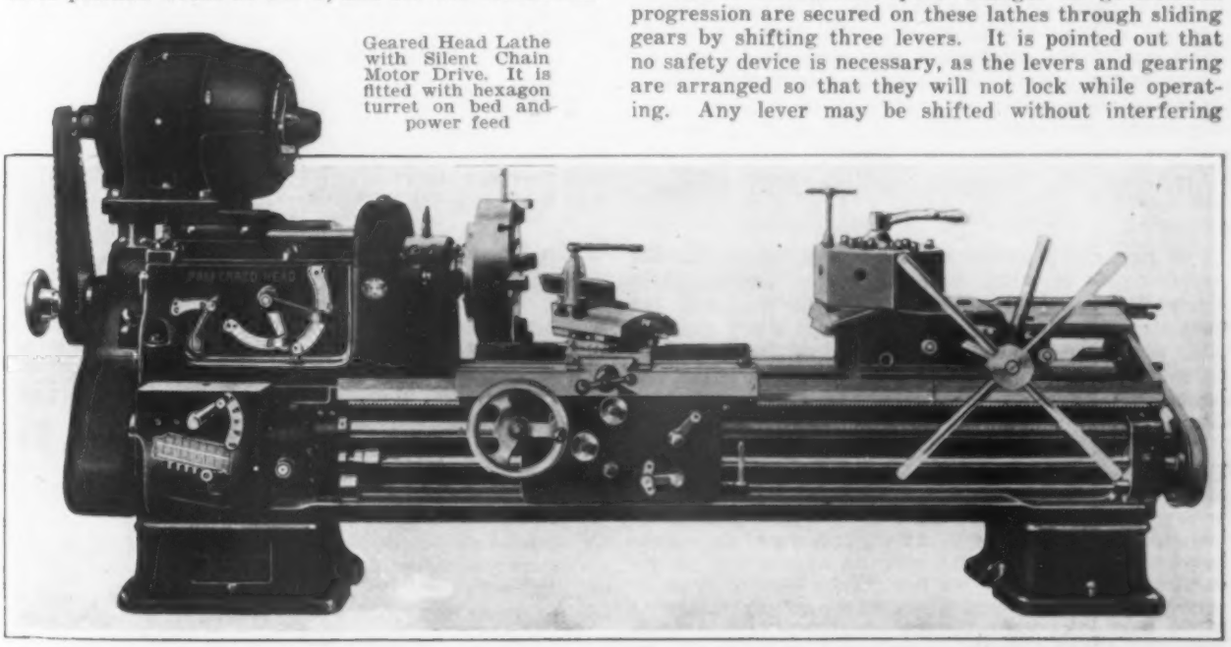
Geared Head Lathes for General Manufacturing

Two late models of geared head lathes made by the Cincinnati Lathe & Tool Co., 3207 North Street, Oakley, Cincinnati, are shown in the accompanying illustrations. These machines are designed to get output as manufacturing lathes rather than for tool work, and are supplied in sizes 16, 18, 20, 22, 24, 26 and 28 in., and for either single pulley belt drive or motor drive.

The lathe shown with the motor drive is fitted with nexagon turret on bed, power feed, and silent chain drive. As the speed variations are obtained in the head, constant speed motors only are required. All speed changes are obtained by levers at the front of the head, the index plate giving the lever positions for each speed. For instance, to obtain 12 revolutions, the lever position would be 3-*B*-*C*, and for 305 revolutions 2-*A*-*D*. A neutral position is also obtained to permit of revolving the spindle by hand for chucking similar jobs.



Geared Head Lathe for General Manufacturing Arranged for Single Pulley Belt Drive Direct from Line Shaft



Geared Head Lathe with Silent Chain Motor Drive. It is fitted with hexagon turret on bed and power feed

The spindle carries only the face gear and one direct driving gear operated by lever *A*-*B*. The intermediate shaft has three sliding gears that mesh with back gears (lever marked 1-2-3). The back gear shaft carries a pair of sliding gears and three stationary gears of different diameter. The drive shaft operates at constant speed and has two sliding gears meshing with gears on the intermediate shaft. When the gear to the left of this shaft is in mesh with the gear on the intermediate shaft it gives the first six changes of low speed. When meshing the gear to the right on the same shaft the additional six changes for the higher speeds are secured.

The shafts in the head are of high carbon nickel steel. The gears on the back gear shaft, also the direct driving gears, are made of steel forgings, all the others being of high carbon nickel steel. All bearings and gears, including those not in use, are oiled automatically by the splash system, an indicator showing the amount of oil in the base of the head. Oil is distributed by the gears to grooving in the top cover.

The other illustration shows the geared head lathe for single pulley belt drive, driven direct from a line shaft. A constant speed motor can be mounted on the headstock or in the rear of the cabinet leg driving through belting, silent chain or gearing.

Twelve mechanical speed changes in geometrical progression are secured on these lathes through sliding gears by shifting three levers. It is pointed out that no safety device is necessary, as the levers and gearing are arranged so that they will not lock while operating. Any lever may be shifted without interfering with another lever. At the apron is a control by which the spindle may be stopped, started or reversed without stopping the overhead works or the motor.

Iron and steel rates between Indiana and Illinois, ordered by the Interstate Commerce Commission, have been put into effect by the railroads. The new tariffs do away with part of the discrepancy in rates between Indiana and Illinois, against which the Public Service Commission of Indiana and shippers of that State have conducted a long fight.

American Trade with Canada in 1919

Exports from the United States to Canada in 1919 were $150,000,000 below those of 1918, while to practically every other important country of the world the exports show an increase. The total to Canada in 1919 was only $734,000,000 against $887,000,000 in 1918, and $829,000,000 in 1917. The decrease is $152,000,000, indicating that to other parts of North America the exports show a large gain. This fall off in exports to Canada in 1919, according to the National City Bank of New York, occurs in a very large part at least in the classes of material which Canada was buying for war purposes in 1918 and 1917, and did not need for that purpose in 1919. Steel billets, for example, fell off $19,000,000 in 1919 as compared with 1918; copper, $4,000,000; lead $2,000,000; steel plates, $3,000,000; steel sheets $2,000,000; tin plate, $5,000,000, and pig iron, $6,000,000.

Among the other classes of merchandise in which the value sent to Canada in 1919 is greater than in 1918 are automobiles, a gain of about $3,000,000.

Many Orders for Belgium

WASHINGTON, March 2.—The iron and steel industry of Belgium is being besieged with orders, according to Consul-General Henry H. Morgan, in Brussels. Mr. Morgan says:

"Although certain branches, notably the iron and steel industry, are swamped with orders, not only for home consumption, but also from abroad, most of the factories, with order books filled up, are operating cautiously in view of the instability of labor conditions and of provisioning in raw material, which has become a serious problem. One of the best proofs of Belgium's improving condition is shown by conditions in the export market, in which iron and steel manufacturers have succeeded in underbidding their rivals with regard to cast steel and other products. England, for instance, has ordered considerable cast steel from Belgian producers. The prices continue to increase in view of the growing number of orders and the lack of available products. Lack of coke has prevented the operation of new blast furnaces. The only Belgian factory actually producing electrical steel is swamped with orders, and it appears that hereafter it will not be necessary to go to Germany for this product. There is considerable demand for construction material, notably for the devastated regions in the north of France."

German Gas Producer Which Also Makes Pig Iron

A new gas producer has been designed by German technologists in which coke is the fuel and to which basic slag is added for liquefying the coke ash, the product of the producer being not only a dry gas, but also a high manganese phosphorus pig iron. Details of this departure as published in *Stahl und Eisen* and abstracted by *Technical Review*, London, are as follows:

According to tests carried out at the *Georgmarienhütte* this producer differs from existing types mainly in the absence of steam admission and hearth heating. In design it is a sort of small blast furnace, in which, however, in contrast to the usual type of blast furnace, the carbon monoxide is not used for the reduction of iron ores, but for heating purposes. Since the iron, in the form of mixer or open-hearth slag, is introduced in the slagged condition, none of the metallic oxides in the slag are reduced by the carbon monoxide, but the metals are extracted from the silicates very quickly by fixed carbon.

The gas produced in the new generator is very rich in carbon monoxide (33 per cent), but contains very little carbon dioxide (0.5 per cent), and water (12 grams per cu. m.). Its calorific value is 1133 cal. Owing to its low hydrogen content, the gas has also a high pyrometrical, thermal effect. The dry gas obtained is practically free from tar, so that the whole of the carbon contained in the coke is used in the process of production. The sulphur content of the dry gas is considerably lower than in coal-fired gas producer.

The quantity of iron produced in the producer amounts to between 500 kg. and 1300 kg. in a double shift of 24 hr., according to the percentage of iron contained in the added slag. This figure corresponds to 16.6 to 43 kg. of iron per ton of coke. The iron has a high manganese and phosphorus content, 7 and 11 per cent in both cases. Where only basic open-hearth slag is added the pig iron has a slightly lower percentage of manganese and phosphorus than where mixer slag is used. The slag tapped off was yellowish-green, thinly liquid and of stony structure; it always flowed smoothly from the producer even where high basic open-hearth slag was used, provided the quantity added was less than usual. The coke used had a carbon content of from 84 to 88 per cent, and yielded 4.7 to 4.9 cu. m. of gas for each kilogram of coke.

Japan with Non-combustible Solvent

A variety of japan which employs a non-combustible solvent is announced by the General Electric Co., Schenectady, N. Y. This is known as water japan, and is an emulsion of the asphalt oil base with water. By this is meant that infinitesimal particles of the base are held in suspension in the water, instead of being dissolved in it. It is stated that this japan has no tendency to settle out, even after months of storage, and that, owing to its being suspended in water, losses by evaporation are practically negligible.

The methods of applying the japan are two in number, the electric dip and the hot dip. The former is appropriate for small articles and consists in placing them, charged positively, in a negatively charged iron tank of japan. An even, smooth coating of japan is deposited on the articles, and since the japan is deposited free from solvent, there is no resultant drip when the lot is conveyed to the baking ovens.

The second method, or the hot dip, is applicable to large pieces of metal. The metal is preheated before dipping, this preheating evidently having the same effect of causing the japan to form a deposit on the metal as giving it a positive electrical charge. A third method is also sometimes used which is a combination of these two methods—that is, the metal is both heated and positively charged.

German Export Steel Prices

The prevailing export prices of certain German steel products are given as follows by the London *Iron and Coal Trades Review*, Jan. 30:

Holland and the Dutch Colonies.

	Florins.
Bars and shapes	475
Hoops and universal flats	280
Plates	250 fl. to 275

Switzerland.

	Francs.
Bars and shapes	500
Hoops and universal flats	600

Sweden.

	Kronor.
Bars and shapes	415
Hoops and universal flats	490
Medium and light sheets	450

Norway.

	Kronor.
Bars and shapes	430
Hoops and universal flats	506
Light and medium sheets	500
Plates	475

Denmark.

	Kronor.
Bars and shapes	475
Hoops and universal flats	550
Plates	475
Light sheets	550

Italy.

	Francs.
Bars and shapes	500
Hoops and universal flats	600

(Swiss currency.)

Spain.

	Pesetas.
Bars and shapes	500
Hoops and universal flats	600

Belgium.

	Francs.
Bars and shapes	915
Hoops and universal flats	1,115

France.

	Francs.
Bars and shapes	950
Hoops and universal flats	1,150

These prices are per ton for basic material on the freight basis of Oberhausen.

The prices for Poland, Finland and Austria are 4,000 marks, 4,000 marks and 4,750 marks respectively.

New Plant for Producing Ferroalloys

Electric Ferrosilicon and Ferrochrome Made by United States Ferro Alloys Corporation in One of the Largest Units

THERE has been in recent years, partly as a result of the war, a decided increase in the number of plants producing certain important ferroalloys, especially ferrosilicon of the higher grades and ferrochrome. One of the most recent of these is the new plant of the United States Ferro Alloys Corporation at Niagara Falls, N. Y., which was completed in 1919. It is claimed that the main building of this plant is the largest in the United States devoted to the ferroalloy industry. The plant is located on the Witmer Road, Niagara Falls, N. Y., and is situated close to the two largest electrode producing plants in the country, the Republic Carbon Co. and the National Carbon Co.

The plant, as it now exists, covers an area of 10 acres, and is located on a 30-acre site, which was recently purchased by this corporation. The present undertaking is only the first step in an extensive program which the company has in view. Possibilities of expansion are large, as the site has a depth of over 4000 ft., which permits of the installation of a central track system of railroading serving the different departments from each side of the system. Building operations were commenced last June, and the first unit, which is of 4000 hp., was put in operation Oct. 15. At the present time about 11,000 hp. is in operation and according to the calculations of the company there will be from 15,000 to 16,000 hp. operating by June of the present year.

The new company is now producing electric ferrosilicon and ferrochrome, but it is expected that later other products will be made. The initial program embraces the installation of furnaces covering four different products, utilizing from 21,000 to 22,000 hp., which it is expected will be in operation by the end of 1920. The main building, which is the furnace building, is a modern structure of brick and steel, served by three electric traveling cranes and a track system extending through the entire length of the building, permitting the receipt of raw material and the shipment of finished product when outside operations, because of the weather, are not possible. Raw materials and finished products are stored in an extensive system of bins, which are calculated to be of sufficient capacity to insure the operation of the plant for several weeks in case of delay in receipt of supplies.

The transformer room, which is a leanto on the south side of the main building, is of solid brick construction and has floor space sufficient to house transformer capacity of 25,000 hp.

In the designing of the plant it was the aim to reduce manual labor to a minimum, and a system of unloading cars was installed which permits the dumping of the material from the cars into a hopper between the rails and the conveying of it from there by means of elevators and conveyors directly to the bins inside the furnace building. This material can also be carried by the same conveyors to the yard storage and there unloaded. Nearly a mile of trackage system is provided for the handling of the raw material and the loading of the finished products, which is accomplished by locomotive cranes and one auxiliary locomotive engine.

There is a machine shop in a separate building which takes care of the necessary maintenance and repairs, and in the same building there is a store room. A second store room building has been provided for the storage of heavy machinery and higher priced raw materials.

A sprinkler cooling system has been installed, the hot water being returned from the different points in the plant to a system of pumps. These pumps force the water into the sprinkler system and the water, after being cooled, is again pumped from the main reservoir to a water tower, from which it is returned again to serve as a cooling medium wherever required.

The company controls and has contracted for the total output of mines producing chrome ore.

The office, which is of brick, has a laboratory on the ground floor, besides the regular offices, and the upper floor contains living quarters for the caretaker, drafting room, dining room and spacious recreation room for employees. Besides this, there has been provided a large garage as well as several cottages for the foremen of the different departments, and also houses for the accommodation of the workmen. The electric power used is supplied from one of the Niagara Falls power stations.

The technical and manufacturing end of the business is in the hands of Robert Turnbull, who is managing director, and who has had a wide experience in the production not only of electric steel in Canada, but also of synthetic or low phosphorus electric pig iron made from steel scrap in that country during the war. Several New York capitalists are interested in the company, which is capitalized at $3,000,000, and of which Parker Sloane is the president, H. C. Sicard, the treasurer, and William D. Sloane, manager of sales, all located at 30 East Forty-second Street, New York.

General Fireproofing, the house organ of the General Fireproofing Co., Youngstown, announces a new departure in that instead of being an agents' house organ as previously, the publication will be used to promote and increase good-will particularly between architects, engineers, contractors and the company. The February number, the first issue under the new plan, is attractive in appearance, well illustrated, and contains articles of particular interest to the contractor and architect.

H. Rosenfield, formerly connected with K. Laurie, Hartford, Conn., sheet metal work, is in business for himself, being located at 303 Market Street, that city.

Car Troubles Continue at New England Foundries

During the past week several small New England foundries were obliged to suspend operations either through the lack of coke or pig iron. A Whitman, Mass., foundry was closed for two weeks, but has resumed, having obtained a car of coke. Several of the largest foundries are fast running out of raw material and unless relief is experienced within the near future will be obliged to suspend. There also are several important manufacturing concerns hard pushed for coal. R. H. Rice, manager General Electric Co., Lynn, says there is sufficient coal on hand to keep the plant running only two weeks, and is apprehensive of a shutdown if present weather conditions continue.

To illustrate the condition of New England's railroad transportation, an incident is cited where a car of coke, which left Providence Jan. 10, arrived at Boston Feb. 28. Passenger trains make the run in one hour and five minutes. It took three weeks to get a car of coke around from the Everett coke works to a Dorchester consumer. In ordinary times the car would have made the trip in three days at the longest.

The Brown & Sharpe Mfg. Co. hauled in trucks over the roads a car of iron from Worcester to Providence. The car of iron had become frozen in Worcester. Pig iron shipped from Alabama last December finally arrived in Worcester early in February, and since then has been frozen to the tracks there and unmovable. There are hundreds of cars of coke and iron frozen or snowed in at New England railroad points and railroad officials say it will be weeks before the cars are freed.

Canadian Consolidation Talk Revived

TORONTO, March 1.—Events of immense importance to the steel industry of Canada, and far reaching in their ultimate connections are developing rapidly with the arrival in Canada of Col. Grant Morden, M.P., for it is he who has been the chief worker behind the ambitious plans that would weld together the Dominion Iron & Steel Corporation, the Nova Scotia Steel & Coal Co., and other allied industries, into a closely coordinated group fit to stand as a Canadian-Imperial producer of iron and steel, in rivalry with United States steel concerns, not in extent necessarily, but placed on a fighting competitive basis. Col. Grant Morden reached Montreal recently, after a conference in New York with Mark Workman, president of the Dominion Steel Corporation, and Sir Newton Moore, one of the steel experts of the British interests, and at once went into conference again with Dominion Steel interests, Roy Wolvin, J. W. Norcross, president of the Canada Steamship Lines, and others who are closely associated with the plans on foot. Colonel Morden stated that he is investigating the whole question from a broad standpoint of the steel industry, but as yet had no definite statement to make. But the broad outlines of the conception of Colonel Morden and his British associates are gradually becoming known to a widening circle. It is again asserted that in the face of broadcast denials, that the Dominion Steel Corporation and the Nova Scotia Steel & Coal Co. are to come together.

Good Showing for Exports

WASHINGTON, March 2.—The slump in exports which was feared during the month of January failed to materialize, judging from the official figures for that month as issued by the Bureau of Foreign and Domestic Commerce. The exports totaled $731,000,000, as compared with $682,000,000 in December and $623,000,000 for January of last year. For the seven months ended with January, the exports totaled $4,594,000,000 as against $3,797,000,000 for the corresponding period of the previous year.

There was a decided increase in imports during January, the total reaching a record figure. Imports for the month jumped to $474,000,000 from $381,000,000 in December. Imports in January, 1919, were valued at $213,000,000; for the seven months ended with January, imports were valued at $2,768,000,000, as compared with $1,698,000,000 for the corresponding period last year.

The January figures appear to bear out the comment of the officials of the Government that notwithstanding the unprecedented balance of trade, the break in foreign exchange and other adverse conditions, American exports are being financed in one way or another.

Contracts for Otis Sheet Plant

Contracts have been placed for the bulk of the equipment for the new sheet mill plant to be erected by the Otis Steel Co., Cleveland, and fairly good deliveries have been promised, so that the company expects to have the plant in operation during the coming fall. Work on the foundations is being started. There will be eight sheet mills, each consisting of one stand of roughing rolls and one stand of finishing rolls. The mills will be arranged in two units, each unit of eight stands driven by a 1000-hp. motor. The mills will be built by Mackintosh, Hemphill & Co., Pittsburgh, and the motors will be supplied by the Allis-Chalmers Co., Milwaukee. The Falk Co., Milwaukee, will supply the mill gears. There will be eight pair furnaces, eight double sheet furnaces and seven two-door box annealing furnaces which will be furnished by the George J. Hagan Co., Pittsburgh. All the furnaces will be fired with powdered coal. The contract for the coal system has been given the Quigley Furnace Specialties Co., Inc., New York, and the coal pulverizer will be supplied by the Raymond Bros. Impact Pulverizer Co., Chicago. Five ¼ x 156-in. motor driven shears will be supplied by the Erie Foundry Co., Erie, Pa., and a vertical bar shear by the United Engineering & Foundry Co., Pittsburgh. A Baird water cooled standing floor will be installed by the National Roll & Foundry Co., Avonmore, Pa. Two Mesta pickling machines have been purchased.

The main building, which will be 900 ft. long by 200 ft. wide, will be erected by the American Bridge Co. It will be covered with corrugated sheets supplied by the Youngstown Sheet & Tube Co. and will have David Lupton Sons Co. windows. The plant will be equipped with six cranes ranging from 10 to 40 tons. An order for these has been placed with the Cleveland Crane & Engineering Co.

The company is now erecting an addition 100 x 120 ft. to its machine shop and contract for it has been placed with the McClintic-Marshall Co., and will shortly erect a bridge over the Baltimore & Ohio Railroad, which will be provided with both wagon and rail tracks connecting the two parts of its Riverside works. Its two blast furnaces are on one side of the track and the present plate and jobbing mill plant and site for the new sheet mill plant are on the opposite side.

Algoma Steel Corporation Places Contracts

The Algoma Steel Corporation, Sault Ste. Marie, Ontario, Canada, which is building large additions to its plants, has placed contracts for some of the equipment needed for these additions with builders of steel works machinery in the Pittsburgh district. The Mesta Machine Co. received contracts for a 35-in. and for a 40-in. blooming mill, Alex Laughlin & Co., for reheating furnaces and soaking pits, the cranes went to the Dominion Bridge Co., Montreal, structural steel for buildings and runways to the Hamilton Bridge Works Co., Hamilton, Ontario, main mill, and d.c. motors to the Canadian Westinghouse Co., Toronto, a.c. motors to the Canadian General Electric Co., Toronto; tables, conveyor and hot bed to the Mesta Machine Co., M. H. Treadwell Co., and the Turner, Fricke Mfg. Co.

A ballast cleaning machine for mechanically removing dirt out of stone ballast between railroad tracks is announced by the Link-Belt Co., 910 South Michigan Avenue, Chicago. It is operated by a 3-hp. gasoline engine and the construction is such that trains can pass on either track while the machine is operating.

Suspended Molding Machine Effects Savings

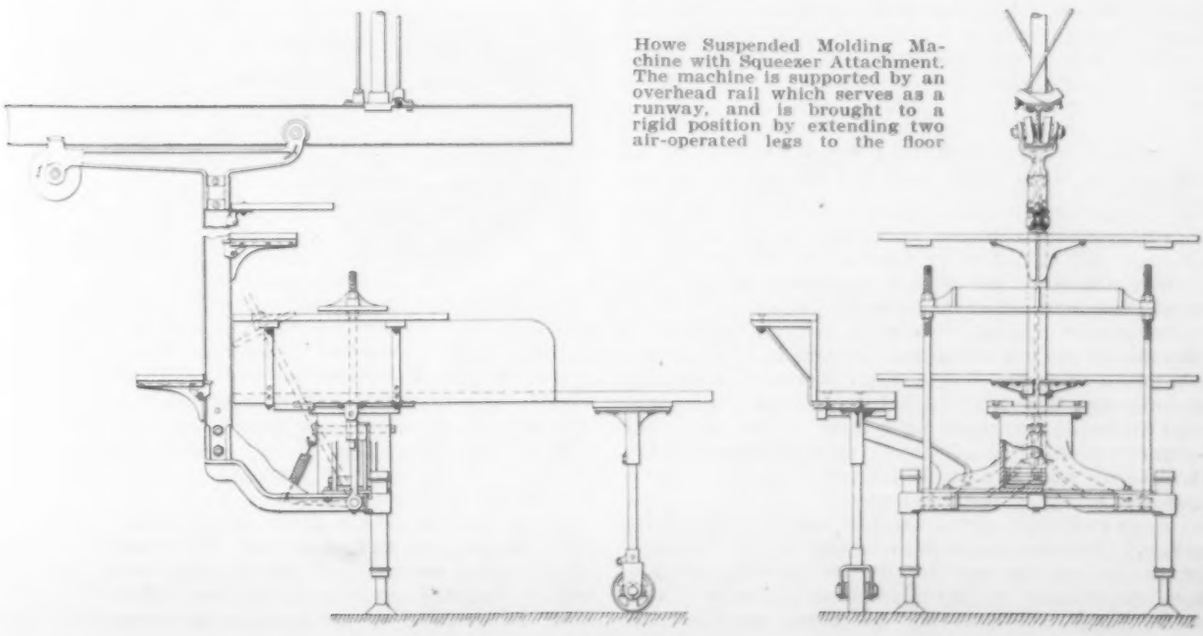
Molder Starts Work at Aisle and Progresses Toward Wall, Depositing Work As He Goes, Without Helper

THROUGH the installation of suspended molding machines the Standard Malleable Iron Co., Muskegon Heights, Mich., has effected an increase in production per molder of from 15 to 30 per cent, depending on the class of work done. The machine, invented and patented by E. L. Howe, president of the company, hangs on a rail which extends lengthwise over the molding floor. A single workman can easily move the machine by hand to any point on the rail, and through the adjustment of pneumatic-controlled legs can fix the device firmly in a stationary position regardless of the irregularities of the floor. The legs, it will be noted by referring to the line drawing, are in reality plungers fitted in pneumatic cylinders, and may be withdrawn or extended by admitting air to or releasing it from the cylinder chambers. When the molder wishes to move the machine he turns a stop cock to liberate the air from the cylinders. When he desires to place the machine in a fixed position, he turns on the air, thereby forcing the legs against the floor. The legs are fitted with concave cups which grip the sand under foot and insure the rigidity of the machine.

The Howe machine, in its simplest form is really a movable molding bench. Formerly when the benches in the company's foundry were situated at the wall end of each molding floor, the molder was forced to carry his work the length of the floor to the aisle, at the same time running the risk of shifting the molds. The suspended bench enables him to commence work close to the aisle, at the end of his sand pile, and gradually move toward the wall as his day's work progresses. Under this plan the molder places the mold on the floor directly behind him. The machine also enables the molder to handle all his own molds, even though large, whereas ordinarily a helper is needed to carry out the molds.

Another advantage of the Howe device is that the molder's afternoon work is not interfered with by the heat radiating from the sand. When the wall benches were in use the last sand dumped from the morning molds would be adjacent to the molder when he resumed work in the afternoon. In the summer output was often reduced because the men could not stand the increase in temperature due to the hot sand. The suspended bench, on the other hand, enables the molder to progress back to the wall, using up the sand as he goes, just as he did in the morning.

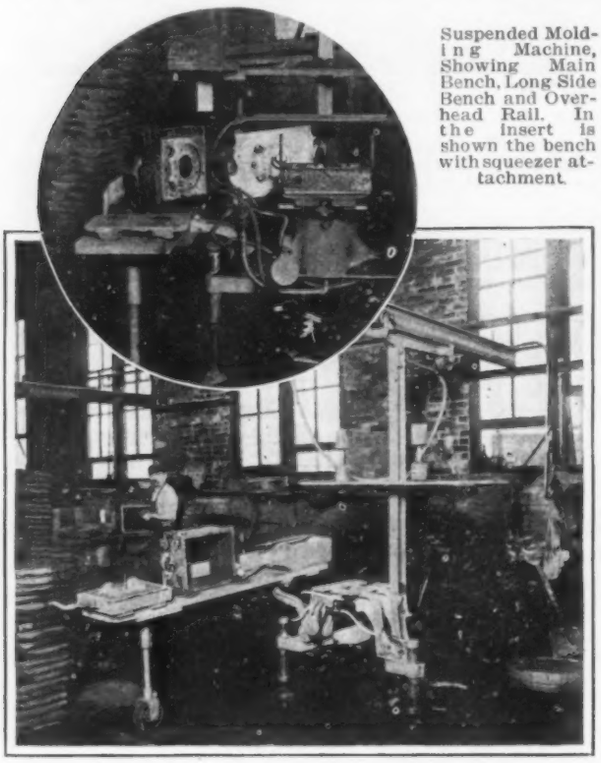
Among the benefits derived from the use of the machine is a marked saving in labor. Whereas the Standard company formerly employed 22 laborers and 22 molders for each 10-ton furnace, it now secures satisfactory work with 16 of both classes of workmen. In the case of common labor which is paid by the day the use of the machine has resulted in a clear saving of the wages of six men per furnace. On the other hand, the molders, who are on piece work, have been the



Howe Suspended Molding Machine with Squeezer Attachment. The machine is supported by an overhead rail which serves as a runway, and is brought to a rigid position by extending two air-operated legs to the floor

beneficiaries of the increase in output made possible by the suspended bench.

A strong argument for the machine is that it facilitates the use of a sand cutter. In many malleable foundries molding methods are such as to make the employment of a sand cutting machine impracticable, but the contrary is true in the Standard company's plant. The sand is dumped from the flasks in a pile extending from the aisle to the wall parallel with the course of the molding machine. At the close of molding operations for the day the sand machine cuts the sand in each pile in the foundry. It moves from aisle to wall and back in the brief time of 1½ min., as compared with 30 min. of hand labor employing several men. Not only is mechanical cutting much faster than



Suspended Molding Machine, Showing Main Bench, Long Side Bench and Overhead Rail. In the Insert is shown the bench with squeezer attachment

shoveling, but it gives more uniform results. The cutting machine is operated by electricity, plugs from the columns at the ends of the molding floors.

The Standard Malleable Iron Co. has installed 84 suspended molding benches in its plant. Each machine is equipped with adjustable shelves and a long side bench. The latter is attached to the machine by a bracket and is supported on a wheel, as will be noted in the illustrations. The Howe device is advantageous not only for the reasons previously pointed out, but because special purpose machines can be mounted on it. This, in fact, has been done in the case of a number of benches in the Standard plant.

New Officials of Bliss & Laughlin, Inc.

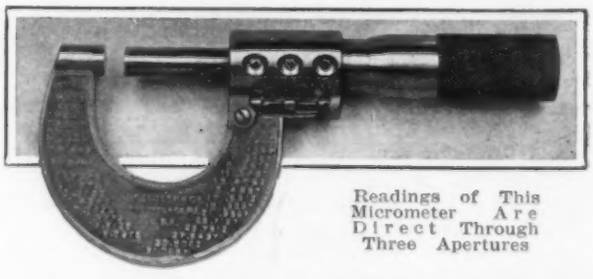
Walter R. Howell, the new vice-president and general manager of Bliss & Laughlin, Inc., manufacturer of steel products, Harvey, Ill., began his career in the iron and steel business at the age of 14 as a water boy in the mills of the Illinois Steel Co. After seven years' experience at the Milwaukee Works in various capacities, Mr. Howell was placed in charge of bar schedules in the Chicago office. He was later promoted to chief clerk of the bar division and at the time of severing connections with the Illinois Steel Co. he was assistant to the manager of the order department. On the entry of the United States into the World War, Mr. Howell was sent to Washington by the Illinois Steel Co. to assist the Government. He first served the American Iron and Steel Institute, for which he gathered statistics pertaining to the entire steel output of this country, and in addition he allocated tonnages purchased by the Government. After three months Mr. Howell enlisted, receiving a commission as first lieutenant in the procurement division of the Ordnance Department, duty assigned him being to supervise the purchase of vast quantities of shell forgings and cold-rolled steel. In August, 1918, Mr. Howell was ordered to France with special instructions to locate in Paris. On arrival in France he reported to an artillery school to make a study of artillery material, and after finishing the required course, was placed in charge of the Ordnance Department shop, supervising the work of overhauling small arms and artillery pieces. After the signing of the armistice he continued his duties in this branch of service. Returning to this country on March 1, 1919, Mr. Howell, after being honorably discharged from Government service, reentered the employ of the Illinois Steel Co., remaining with that company until Jan. 1, 1920, on which date he assumed active management of Bliss & Laughlin, Inc.

C. E. McKillips, Jr., sales manager of Bliss & Laughlin, Inc., to gain practical knowledge pertaining to the manufacture of iron and steel products, entered the employ of the Carnegie Steel Co. and worked in various capacities in the furnaces and rolling mills. He then entered the Pittsburgh sales office. On leaving the Carnegie Steel Co., Mr. McKillips joined the sales force of the Cambria Steel Co. In 1915 he was transferred to the American Steel Export Co., then a subsidiary of Cambria, and up to the date of his enlistment in Government service in May, 1917, acted as salesman and buyer for that company in New York. Entering one of the first officers' training camps, Mr. McKillips received a commission as first lieutenant. He was assigned to duty with the 79th Division, going overseas in July, 1918. After being wounded, he was sent back to the United States in January, 1919, and was honorably discharged from service in June of that year. Mr. McKillips then resumed his former position with the American Steel Export Co., which he retained until entering the employ of Bliss & Laughlin, Inc., on Jan. 1, 1920, as sales manager.

Edward M. France, general superintendent of Bliss & Laughlin, Inc., entered the employ of Lindeman & Hoverson Co., Milwaukee, at the age of 14. He operated all types of machines in use by this company and later worked as a mechanic in numerous other manufacturing plants. At the age of 20 Mr. France took a position with Lutter & Gies, manufacturers of shapers and grinders, and became foreman of the plant. He was later foreman with the Four Wheel Drive Truck Co., Milwaukee, and of different machine shops.

Direct Reading Micrometer

The direct reading micrometer shown in the accompanying illustration is being manufactured by J. T. Slocomb Co., Providence, R. I. The tool has been cut away to show the counting wheels and pinions. The



Readings of This Micrometer Are Direct Through Three Apertures

reading is direct on every thousandth and reads from 0 to 999. For measurements to an accuracy of 0.0005 in. it is only necessary to see that the right-hand figure is about central in its aperture. Where greater refinement is required, reference is made to the nearest line on the thimble to see how it corresponds with the revolution line on the sleeve. The screw is 50 pitch and there are 20 divisions on the thimble and also on the counting dials.

It is explained that the counting device adds but little to the size and weight of the instrument, and as it is about central, it makes the micrometer balance well in the hand, and also allows the micrometer to be held and operated by one hand in the usual way.

Truscon Steel Co. Additions

President Julius Kahn of the Truscon Steel Co. announces extensive additions will be made this year to the Youngstown, Onio, plant, involving substantial capital expenditures. New steel buildings of the Kahn standardized type will be erected and machinery installed to add to the plant's productive capacity, while its shipping facilities will be enlarged 100 per cent. Buildings for which provision has been made will cover nearly three acres and add almost 30 per cent to the present floor space of 10 acres.

The largest of the new buildings will be 65 x 918 ft., west of the present plant and will be used for manufacturing and shipping purposes. An addition 80 x 205 ft. will be made to the main building, which is now 80 x 1185 ft. North of department H, another structure 80 ft. wide, for which excavations have been started, will be erected. A safety and service building 50 x 150 ft. will be constructed directly south of the main plant entrance. This structure will house the headquarters of departments of sanitation, safe conditions of employment, health service and advice, investigation of complaints and grievances, welfare activities and recreation.

Some of these departments are in an advanced state of organization and operation, while the scope of all will be enlarged under direction of Garrett A. Connors, director of safety and service.

Work on the additions will commence as soon as weather conditions warrant. The steel will be fabricated on the premises.

The Japanese plant of the Truscon Steel Co., located on the national highway, near Tokio, is practically complete. All steel work used in its construction was fabricated at the Truscon plant in Youngstown and shipped ready for erection. Capt. Fay Shackleton, who went from Youngstown, supervised construction and will have charge of operation.

Four Foundrymen's Associations Meet

A joint meeting of members of the Gray Iron Club, the Newark Foundrymen's Association, the Metropolitan Brass Association and the Foundry Foremen's Association was held in the Building Trades Exchange Building, 34 West Thirty-third Street, New York, the evening of Feb. 26, the chief speaker being Dr. Richard Moldenke, Watchung, N. J. There was an attendance of 75 at the dinner tables. J. N. Graham, Elevator Supplies Co., Hoboken, N. J., president the Gray Iron Club, introduced the speakers and gave a word of welcome. A. E. Barlow, Barlow Foundry, Inc., Newark, N. J., president Newark Foundrymen's Association, commented on the desirability of co-operation among foundrymen. A professional entertainer poked fun at politics and prohibition.

Dr. Moldenke's talk was practically that given before the New England Foundrymen's Association, as reported in THE IRON AGE of Feb. 19. In addition to facts published there, he said that gray iron was in reality steel plus graphite, with traces of slag; the tendency is to buy iron with silicons lower, taking increasing care in the melting; that pig iron should be purchased "on the center line as to silicon"—that is, order 2.50, for instance, instead of 2.25 to 2.75; foundrymen should use two or three brands, mixed well in the yards, to offset bad iron with good; the ultimate place of poor scrap is in the electric furnace, where it will be purified; rusty scrap is not harmful, but burnt scrap is.

New Foundry at Columbiana, Ohio

The Columbiana Foundry Co. of Columbiana, Ohio, an Ohio corporation, has applied for an increase in its capital to $150,000, the increase to be used largely in the erection of a gray iron foundry at McKeesport, Pa. A contract has been let for the erection of a one-story, all steel building, 100 x 300 ft., to contain the main foundry, also a brick pattern storage and office building, 25 x 150 ft. The company plans to equip this new foundry with the most modern equipment, and when completed, its products will be gray iron, semi-steel and brass castings. The new site is on the main line of the Baltimore & Ohio Railroad, which will afford excellent receiving and shipping facilities. Work on the foundry will start at once. This company is also building a large addition to its present foundry at Columbiana, which is about completed and will be used for making small specialty gray iron parts.

Society of American Military Engineers

The Society of American Military Engineers is being established as an organization to which all professional engineers, whether or not they were engaged in the past war, are eligible in at least some grade of membership, provided only that they are interested in national events. The objects of this society are to promote solidarity and co-operation between engineers in civil and military life, to determine technical knowledge bearing upon progress in the arts of war and the application of engineering science thereto. Its activities will be promoted through its journal, the *Military Engineer*, whose first issue was published for January-February this year. It succeeds *Professional Memoirs*, which has been the journal of the Corps of Engineers of the Army. Col. T. S. Bond, Engineers, U. S. A., is editor; and Major H. R. Richards, Engineers, U. S. A., is business manager.

Large Decrease in Lackawanna Earnings

Another steel company to show a marked dropping off in earnings for 1919 over 1918 is the Lackawanna Steel Co., Buffalo, whose rate of profit on its common stock was only 1.02 per cent, as compared with 23.79 per cent in 1918. The profits for the two years were $356,863 and $8,348,355, 1919 and 1918 respectively. The poorest showing of the company was in 1911, when profits were but 24 cents a share; the best record was in 1917 when the earning equivalent was $45.89.

To pay usual dividends the company last year had to draw upon its surplus to the extent of $1,749,648. Unfilled orders in gross tons at the end of 1919 amounted to 248,405, as compared with 314,948 the year previous. Total net earnings for 1919, after deducting taxes, repairs and maintenance, were $3,060,663, against $12,468,905 for 1918. The falling off in earnings is attributed to labor troubles.

Winchester Earnings

The earned surplus from the consolidated statement of earnings for the period from the consolidation of the Winchester Repeating Arms Co. with the Winchester Co. on April 16, 1919, to Dec. 31, amounted to $1,748,274. The sales and charges for the year were $24,910,903 and the net profits $3,004,023. Under a new plan the company's products are being marketed only through dealers who are stockholders, these dealers now numbering 2200. To increase production of peace time products the company has purchased the Eagle Pocket Knife Co., New Haven, Conn., the Barney & Berry, Inc., Springfield, Mass., the Napanoch Knife Co., Napanoch, N. Y.; the auger bit business of the Lebanon Machine Co., Lebanon, N. H., the wrench business of the Page-Storms Drop Forge Co., Chicopee, Mass., and others.

A tar camera for colorimetric tar determination in producer gas and other operations, is being manufactured by the Steere Engineering Co., Detroit, gas engineer and builder. The operation is based on a rough relation between the shade of tar stain and its weight. The stain is made by passing a certain amount of gas through a piece of special white paper which may then be compared with a standard stain chart for estimating the tar content.

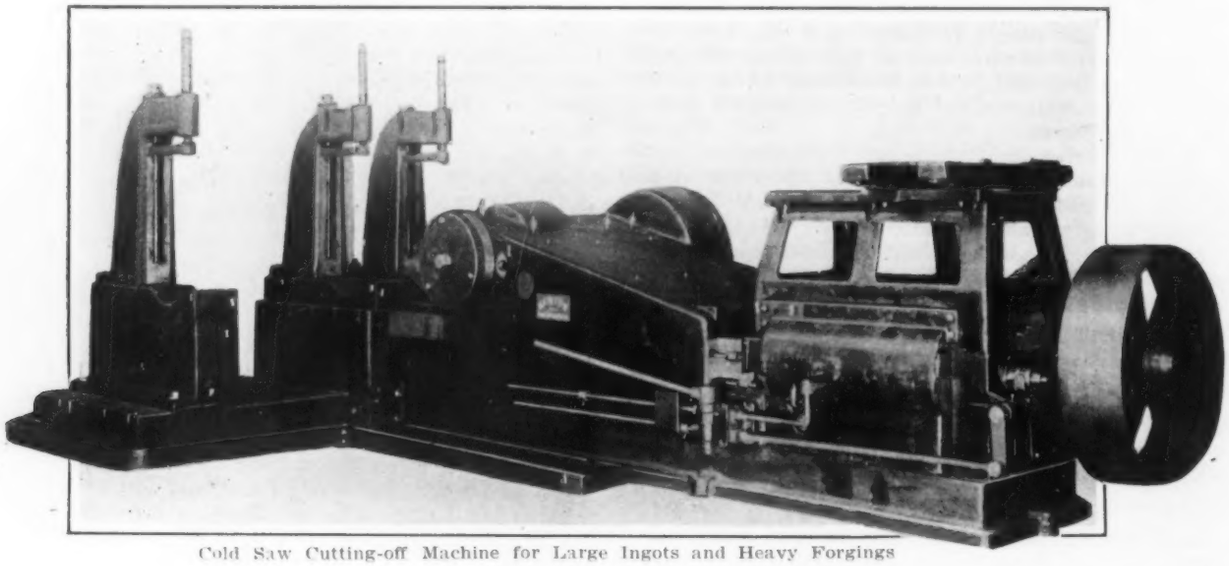
E. S. Jackman & Co., Oliver Building, Pittsburgh sales agents for the Firth-Sterling Steel Co., McKeesport, Pa., manufacturer of high grade tool steels in the territory between Pittsburgh and the Pacific Coast, has placed David E. Jackman, Jr., in immediate charge of sales of the company in the Pittsburgh district.

Cold Saw for Cutting 24-In. Stock

A recent development in cold saw cutting-off machines for cutting large ingots and heavy forgings has been made by the Newton Machine Tool Works, Inc., Philadelphia. This saw is equipped with an inserted tooth saw blade, 76 in. in diameter, which has a capacity for cutting 24-in. diameter stock in one cut.

A main work table is bolted to the machine base and is 56 in. long in the direction of the feed of the saw and 48 in. wide. To this table there is bolted a platen 60 in. long and 56 in. wide and 12 in. deep, with suitable tee slots. On this platen there is a clamping block which is 18 in. wide at the base and 12 in. wide at the top. This block is in line with the top of the main table.

Two V-blocks are fitted to the main work table and one V-block is fitted to the platen, making a total of three V-blocks. A swivel arch clamp is supplied for each of these V-blocks, all arranged to hold a piece 32 in. in diameter.



Cold Saw Cutting-off Machine for Large Ingots and Heavy Forgings

The drive of the machine is from belt connected motor through a solid bronze worm wheel and hardened steel worm fitted with roller thrust bearings, both incased to run in oil, and spur pinion with teeth cut in the solid shaft, to the spindle driving gear.

The feed motion is taken from the drive shaft through gears to the oil-tight feed box, in which the change gears are mounted on sliding sleeve controlled by latch levers in the cover. From this box the motion is transmitted to the saddle feed screw through a feed worm and worm wheel which is positively clutched. The control of the machine is from the rear and forward feed is provided with automatic stop and rapid traverse forward and back with automatic stop. Feed and rapid traverse mechanism is inclosed with curtain covers. Positive safety release is provided for each extreme position of traverse.

The oil and chip pan is cast on the base to drain the lubricant back to the reservoir. A loose chip pan is fitted between the tables for draining to this oil pan.

This description with the wrong illustration was given in THE IRON AGE, issue of Feb. 26, page 612.

Electric Steel & Forge Co.'s New Shop

The Electric Steel & Forge Co., Cleveland, has placed in operation its new hammer shop which is equipped with a 6-ton, two 2500-lb., two 1500-lb., one 800-lb., and one 600-lb. steam hammers. When present plant extensions are completed the equipment will also include two 6-ton and one 1000-lb. electric furnaces, one of the larger furnaces already being in operation, and a 15-in., 12-in. and an 8-in. rolling mill, heat treating furnace, machine shop, etc.

The Electric Steel & Forge Co. some time age succeeded the Crucible Steel Forge Co. which was engaged in the manufacture of general machine forgings for 15 years. The former company also made special alloy die blocks and piston rods and the new company will specialize in these two products in addition to making high grade tool steels and special alloy steels. The company has a capital stock of $2,000,000. J. H. Foster, president the Hydraulic Pressed Steel Co., is president; D. T. Wells, vice-president and general manager; C. B. Cross, secretary; A. B. Smythe, treasurer; P. W. Coburn, purchasing agent; I. R. Watts, sales manager, and C. A. Swan, superintendent.

Construction Equipment Distributors Organize

The National Distributors Association of Construction Equipment was recently organized "for the purpose of promoting and maintaining a co-operative spirit between the legitimate distributors of construction equipment and their source of supply; to disseminate information among its members that will assist them in building their business on a broader scale and to exchange ideas of service for the benefit of the actual users of construction equipment." The office of the secretary is at 210 Wells Street, Milwaukee, Wis. The executive committee consists of: J. S. Beckwith, Beckwith Machinery Co., Pittsburgh; C. J. Borchert, Borchert-Ingersoll Co., St. Paul; R. E. Brandeis, Brandeis Machinery Co., Louisville; H. G. Ferris, Hofius-Ferris Co., Spokane; M. R. Hunter, Kern-Hunter Co., Milwaukee; H. C. Legg, Landes & Co., Salt Lake City; W. B. Louer, W. B. Louer Co., Chicago; C. E. McCombs, Pattison Supply Co., Cleveland; K. B. Noble, Hartford Contractors Supply Co., Hartford; Geo. Smith, Geo. F. Smith Co., St. Louis; F. W Swanson, Globe Machinery Co., Des Moines.

Refining Low Carbon Basic Steel

A method of refining basic low carbon steel is covered by a patent (U. S. 1,309,162) granted to William R. Walker, assistant to the president, United States Steel Corporation, 71 Broadway, New York. The method involves maintaining the metal in the ladle at a proper pouring temperature for a sufficient time to de-gasify the melt and yet under a slag so modified that rephosphorization will not result. Thus when the open-hearth is tapped the metal runs into a ladle of such size that most of the slag overflows. The remainder may be skimmed mechanically and replaced by a molten phosphorus-free slag, or if the furnace-slag be low in phosphorus, lime may be added in the runner so it is intimately mixed with that portion of the slag remaining in the ladle, thus increasing its viscosity and consequently decreasing the rephosphorizing action at the surface of the metal. During the time the metal is in the ladle it is kept hot, preferably by electrical currents induced by a high-frequency coil placed about the ladle.

Interest Centers in Railroad Buying

Programs Include Extensive Expenditures for Chicago and Cincinnati Terminals—Some Orders for Rolling Stock Placed and More Expected Soon

CHICAGO, March 2.—The return of the railroads from Government control to private hands ushers in what is expected to be an extensive program of the rehabilitation of properties and equipment. In Chicago two great terminal projects are to be noted. The Chicago Union Station program, which has been under way for some time, will involve a total outlay of about $20,000,000 in construction costs alone. Negotiations are now nearing completion for a new issue of Chicago Union Station Co. bonds, to be offered early this month. It is planned gradually to place with investors the entire $30,000,000 remaining of an authorized issue of $60,000,000, but the initial issue will involve only $10,000,000. When this is floated, it is believed that the fabricating award of 17,000 tons for the main station structure will finally be made.

The other large terminal project, involving the electrification of Illinois Central lines in Chicago and the construction of new passenger and freight station facilities, will entail an expenditure of about $80,000,000, according to rough estimates so far made. Work of these improvements, however, will be spread over a period of years, the date for full electrifications of all lines having been set for about 20 years hence. One of the most important features of the Illinois Central program from the standpoint of better freight transportation, now regarded as a prime need of the business world, is the Markham freight yard, a $4,000,000 improvement, already partially constructed.

The Erie has bought 1000 box cars from the Standard Steel Car Co. The Southern Pacific will construct 1000 box cars in its own shops. The Canadian National Railways have ordered 1000 box cars from the National Car Co. and has divided a like number between two other Canadian car builders. The Illinois Central is in the market for 110 locomotives of the Mikado, Pacific and switcher type, and the Chicago and Northwestern is also contemplating the purchase of a large number.

The Soo Line has ordered five switchers from the American Locomotive Co. in addition to the 25 Mikado type engines previously mentioned. The Missouri Pacific is in the market for five switch engines.

Railroad inquiries and orders for rolling stock, which have been on the increase in the past few weeks, are expected to expand to large proportions now that Government control has actually terminated. Competent observers estimate that at least 100,000 freight cars will be ordered within the next month or two provided that car builders can secure satisfactory co-operation from the steel mills. Purchases of motive power and passenger cars are expected to be proportionate. The most important of recent purchases of freight equipment is an order by the Santa Fe for 2500 refrigerator cars, divided equally between the American Car & Foundry Co. and the Haskell & Barker Car Co. Among current car inquiries, some of which have been previously mentioned in THE IRON AGE, are the following:

New York Central Lines, 15,300 freight cars and 261 passenger train cars.
Rock Island Lines, 3250 freight cars.
Grand Trunk, 3000 automobile cars and 1000 flat cars.
American Refrigerator Transit Co., 2028 refrigerator cars.
Missouri Pacific, 2000 box cars and 30 passenger service cars.
Illinois Central, 1000 gondola cars.
Confidential inquiry, 1000 freight cars.
Elgin, Joliet & Eastern, 700 gondola cars.
Seaboard Air Line, 2000 fruit and vegetable cars.
Union Pacific, 65 passenger service cars and 45 cabooses.
Missouri, Kansas & Texas, 40 passenger train cars.
Midland Packing Co., 100 refrigerator cars.
Confidential inquiry, 100 logging cars.
Roger Ballast Car Co., 500 freight cars.

Other railroads are known to be about to issue inquiries. The St. Louis, San Francisco and the St. Louis Southern, for example, are preparing specifications for 1000 box cars each. The Louisville & Nashville, on the other hand, is preparing to construct 1000 box cars in its own shops.

In the locomotive field there is also considerable activity. The Baldwin Locomotive Works has received orders for 45 engines from the Great Northern and 10 from the St. Louis Southwestern. The Soo Line has purchased 25 Mikado type locomotives from the American Locomotive Co. The Atchison, Topeka & Santa Fe is in the market for 50 engines, including Mikado, Santa Fe and mountain type. Canadian roads are also showing interest in new rolling stock. The Canadian Pacific has placed a tentative order for 1500 box cars with the Canadian Car & Foundry Co., and is in the market for 1500 more. The Canadian National Railways have ordered 30 Pacific and 25 Santa Fe type engines from the American Locomotive Co.

Extensive Terminal Plans at Cincinnati

CINCINNATI, March 2.—With the return of the railroads to private ownership, interest is centered on the extent to which the railroads will enter the market for equipment. Local officials of the various roads interviewed declare that no definite information has reached them as yet as to what expenditures are proposed. Any information of this kind to be authentic must come from the head offices of the various companies, most of which are located in Eastern cities. It is definitely known that the Big Four has contracted for this year's supply of rails. This amounts to 36,000 tons, the largest purchase ever made in one year. The major portion of this order went to the Illinois Steel Co.

The Cincinnati, New Orleans & Texas Pacific Railway has asked for bids for the construction of a double track bridge over the Ohio River at Cincinnati to replace the one at present in use, which is too light to take care of the heavy traffic entering the city. The trustees of the Cincinnati Southern Railroad have made tentative plans for the construction of union terminals in this city, which they will shortly submit to the officials of the other roads entering the city. The plans call for an initial expenditure of from $20,000,000 to $30,000,000, and authorization for the issuing of bonds has already been received from the Ohio legislature. The plans as outlined by the trustees are that they secure the land necessary and build the terminals, the other roads to be charged a rental sufficient to cover the interest plus an amount to be placed in a sinking fund to retire the bonds at maturity. It is understood that the railroads entering the city were favorably impressed with the scheme when it was first mooted four years ago, but on account of the war and the subsequent taking over of the roads by the Government, the matter was dropped.

Partial Victory for Department of Commerce

WASHINGTON, March 2.—The fight of the business men of the country to restore the item of commercial attaches in the pending appropriation bill was successful to some extent when the House in committee of the whole acted favorably by a vote of 210 to 39 in putting back into the bill an item of $165,000 for commercial attaches.

Little Known Facts About Grinding and Grinding Kinks is the subject of a 174-page booklet, 5 by 7 in. with stiff cover, published by the Norton Co., Worcester, Mass. These are a series of brief articles by Howard W. Dunbar, treating of commonplace facts concerning grinding and reprinted from Grits and Grinds, the periodical of the Norton Co.

Steel Corporation Is Not Dissolved

Supreme Court Decides It Does Not Violate Sherman Act

Justices by a Vote of Four to Three, with Two Not Participating, Decline to Grant Prayer of the Government—Defendant Declared Not Guilty of Brutal Methods Which Characterized Other Large Companies—Vigorous Dissenting Opinion of Justices Day, Pitney and Clarke Severely Criticises the Steel Corporation

WASHINGTON, March 1—In one of the most important and far-reaching decisions ever handed down, the Supreme Court held to-day that the United States Steel Corporation does not constitute a trust in violation of the Sherman act.

The court affirmed the decision of the New Jersey District Court made prior to the war and thus ends the efforts of the Government to dissolve the Steel Corporation. The Government is given permission to begin new proceedings only in the event that specific violations of law occur in the future.

The decision was by a four to three vote, with two justices not participating. Justice McKenna read the majority opinion and was joined by Justices White, Van Devanter and Holmes. Justice Day filed a dissenting opinion, Justices Pitney and Clarke joining with him. Justice McReynolds took no part because of the fact that he formerly had a hand in the case as Attorney General. Justice Brandeis was disqualified because of an expression of opinion adverse to the Steel Corporation prior to his appointment on the bench. That the Steel Corporation had a narrow shave is indicated by the fact that if these two justices had voted in accordance with their position as taken before going on the bench, the decision would have been different.

The Majority Opinion by Justice McKenna

The majority opinion of the court, as read by Justice McKenna, follows:

Supreme Court of the United States. No. 6, October term, 1919. The United States of America, appellant, *vs.* United States Steel Corporation, *et al.* Appeal from the District Court of the United States for the District of New Jersey.

"Suit against the Steel Corporation and certain other companies which it directs and controls by reason of the ownership of their stock, it and they being separately and collectively charged as violators of the Sherman anti-trust act.

"It is prayed that it and they be dissolved because engaged in illegal restraint of trade and the exercise of monopoly.

"Special charges of illegality and monopoly are made and special redresses and remedies are prayed, among others that there be a prohibition of stock ownership and exercise of rights under such ownership, and that there shall be such orders and distribution of the stock and other properties as shall be in accordance with equity and good conscience and 'shall effectuate the purpose of the anti-trust act.' General relief is also prayed.

"The Steel Corporation is a holding company only; the other companies are the operating ones, manufacturers in the iron and steel industry, 12 in number. There are, besides, other corporations and individuals more or less connected in the activities of the other defendants that are alleged to be instruments or accomplices in their activities and offendings; and that these activities and offendings (speaking in general terms) extend from 1901 to 1911, when the bill was filed, and has illustrative periods of significant and demonstrated illegality.

"Issue is taken upon all these charges, and we see at a glance what detail of circumstances may be demanded, and we may find ourselves puzzled to compress them into an opinion that will not be of fatiguing prolixity.

"The case was heard in the District Court by four judges. They agreed that the bill should be dismissed; they disagreed as to the reasons for it. 223 Fed. 55. One opinion (written by Judge Buffington and concurred in by Judge McPherson) expressed the view that the Steel Corporation was not formed with the intention or purpose to monopolize or restrain trade, and did not have the motive or effect 'to prejudice the public interest by unduly restricting competition or unduly obstructing the course of trade.' The corporation, in view of the opinion, was an evolution, a natural consummation of the tendencies of the industry on account of changing conditions, practically a compulsion from 'the metallurgical method of making steel and the physical method of handling it,' this method, and the conditions consequent upon it, tending to combinations of capital and energies rather than diffusion in independent action. And the concentration of powers (we are still representing the opinion) was only such as was deemed necessary, and immediately manifested itself in improved methods and products and in an increase of domestic and foreign trade. Indeed an important purpose of the organization of the corporation was the building up of the export trade in steel and iron which at that time was sporadic, the mere dumping of the products upon foreign markets.

"Not monopoly, therefore, was the purpose of the organization of the corporation but concentration of efforts with resultant economies and benefits.

"The tendency of the industry and the purpose of the corporation in yielding to it was expressed in comprehensive condensation by the word 'integration,' which signifies continuity in the processes of the industry from ore mines to the finished product.

"All considerations deemed pertinent were expressed and their influence was attempted to be assigned and, while conceding that the Steel Corporation after its formation in times of financial disturbance, entered into informal agreements or understandings with its competitors to maintain prices, they terminated with their occasions, and, as they had ceased to exist, the court was not justified in dissolving the corporation.

"The other opinion (by Judge Woolley and concurred in by Judge Hunt, 223 Fed. 161) was in some particulars in anithesis to Judge Buffington's. The view was expressed that neither the Steel Corporation nor the preceding combinations, which were in a sense its antetypes, had the justification of industrial conditions, nor were they or it impelled by the necessity for integration, or compelled to unite a comprehensive enterprise because such had become a condition of success under the new order of things. On the contrary, that the organizers of the corporation and the pre-

ceding companies had illegal purpose from the very beginning, and the corporation became a combination of combinations by which, directly or indirectly, approximately 180 independent concerns were brought under one business control, which, measured by the amount of production, extended to 80 per cent or 90 per cent of the entire output of the country, and that its purpose was to secure great profits which were thought possible in the light of the history of its constituent combinations, and to accomplish permanently what those combinations had demonstrated could be accomplished temporarily, and thereby monopolize trade.

Sought Co-operation of Competitors

"The organizers, however (we are still representing the opinion), underestimated the opposing conditions and at the very beginning the corporation instead of relying upon its own power sought and obtained the assistance and the co-operation of its competitors (the independent companies). In other words the view was expressed that the testimony did not show that the corporation in and of itself ever possessed or exerted sufficient power when acting alone to control prices of the products of the industry. Its power was efficient only when in co-operation with its competitors, and hence it concerted with them in the expedients of pools, associations, trade meetings, and finally in a system of dinners inaugurated in 1907 by the president of the company, E. H. Gary, and called the Gary dinners.

These dinners were congregations of producers and were nothing but trade meetings, successors of the other means of associated action and control through such action. They were instituted first in stress of panic, but their potency being demonstrated, they were afterward called to control prices in periods of industrial calm. They were pools without penalties and more efficient in stabilizing prices. But it was the further declaration that when joint action was either refused or withdrawn, the corporation's prices were controlled by competition.

"The corporation, it was said, did not at any time abuse the power or ascendency it possessed. It resorted to none of the brutalities or tyrannies that the cases illustrate of other combinations. It did not secure freight rebates; it did not increase its profits by reducing the wages of its employees—whatever it did was not at the expense of labor; it did not increase its profits by lowering the quality of its products, nor create an artificial scarcity of them; it did not oppress or coerce its competitors—its competition, though vigorous, was fair; it did not undersell its competitors in some localities by reducing its prices there below those maintained elsewhere, or require its customers to enter into contracts limiting their purchases or restricting them in resale prices; it did not obtain customers by secret rebates or departures from its published prices; there was no evidence that it attempted to crush its competitors or drive them out of the market, nor did it take customers from its competitors by unfair means, and in its competition it seemed to make no difference between large and small competitors. Indeed it is said in many ways and illustrated that instead of relying upon its own power to fix and maintain prices, the corporation at its very beginning sought and obtained the assistance of others. It combined its power with that of its competitors. It did not have power in and of itself, and the control it exerted was only in and by association with its competitors. Its offense, therefore, such as it was, was not different from theirs and was distinguished from theirs only in the leadership it assumed in promulgating and perfecting the policy. This leadership it gave up and it has ceased to offend against the law before this suit was brought. It was hence concluded that it should be distinguished from its organizers and that their intent and unsuccessful attempt should not be attribued to it, that it in and of itself is not now and has never been a monopoly or a combination in restrain of trade, and a decree of dissolution should not be entered against it.

Purpose of Organizers of the Corporation

"This summary of the opinions, given necessarily in paraphrase, does not adequately represent their ability and strength, but it has value as indicating the contentions of the parties, and the ultimate propositions to which the contentions are addressed. The opinions indicate that the evidence admits of different deductions as to the genesis of the corporation and the purpose of its organizers, but only of a single deduction as to the power it attained and could exercise. Both opinions were clear and confident that the power of the corporation never did and does not now reach to monopoly, and their review of the evidence, and our independent examination of it, enables us to elect between their respective estimates of it, and we concur in the main with that of Judges Woolley and Hunt. And we add no comment except, it may be, that they underestimated the influence of the tendency and movement to integration, the appreciation of the necessity or value of the continuity of manufacture from the ore to the finished product. And there was such a tendency, and though it cannot be asserted it had become a necessity, it had certainly become a facility of industrial progress. There was, therefore, much to urge it and give incentive to conduct that could accomplish it. From the nature and properties of the industry, the processes of production were something more than the stage and setting of the human activities. They determined to an extent those activities, furnished their motives, and gave test of their quality not, of course, that the activities could get any immunity from size, or resources, or energies, whether exerted in integrated plants or diversified ones.

"The contentions of the case, therefore, must be judged by the requirements of the law, not by accidental or adventitious circumstances. But what are such circumstances? We have seen that it was the view of the District Court that size was such a circumstance and had no accusing or excusing influence. The contention of the Government is to the contrary. Its assertion is that the size of the corporation being the result of a combination of powerful and able competitors had become substantially dominant in the industry and illegal. And that this was determined. The companies combined, is the further assertion, had already reached a high degree of efficiency, and in their independence were factors in production and competition, ceased to be such when brought under the regulating control of the corporation, which by uniting them offended the law, and that the organizers of the corporation had in mind the specific purposes of the restraint of trade and the enormous profits resulting from that restraint.

"It is the contention of the corporation opposing those of the Government and denying the illegal purposes charged against it, that the industry demanded qualities and an enterprise that lesser industries do not demand and must have a corresponding latitude and facility. Indeed it is insisted that the industry had practically, to quote the words of Judge Buffington, he quoting those of a witness, 'reached the limit or nearly at which economies from a metallurgical or mechanical standpoint could be made effective' and 'that instead, as was then the practice, of having one mill make 10, or 20, or 50 products, the greatest economy would result from one mill making one product and making that product continuously.' In other words there was a necessity for integration and rescue from the old conditions—from their improvidence and waste

of effort, and that in redress of the conditions the corporation was formed, its purpose and effect being 'salvage not monopoly,' to quote the words of counsel. It was, is the insistence, the conception of ability, 'a vision of a great business which should embrace all lines of steel and all processes of manufacture from the ore to the finished product and which by reason of the economies thus to be effected and the diversity of products it would be able to offer, could successfully compete in all the markets of the world.' It is urged further that to the discernment of that great possibility was added a courage that dared attempt its accomplishment, and the conception and courage made the formation of the corporation notable but not illegal.

"We state the contentions, we do not have to discuss them, or review the arguments advanced for their acceptance or repulsion. That is done in the opinions of the district judges, and we may well despair to supplement the force of their representation of the conditions antecedent to the formation of the corporation and in what respect and extent its formation changed them. Of course in that representation and its details there is guidance to decision, but they must be rightly estimated to judge of what they persuade.

Conflicting Considerations Involved

"Our present purpose is not retrospect for itself, however instructive, but practical decision upon existing conditions that we may not by their disturbance, produce, or even risk, consequences of a concern that cannot now be computed. In other words our consideration should be of not what the corporation had power to do or did, but what it has now power to do and is doing, and what judgment shall be now pronounced—whether its dissolution as the Government prays, or the dismissal of the suit as the corporation insists?

"The alternatives are perplexing, involve conflicting considerations, which, regarded in isolation, have diverse tendencies. We have seen that the judges of the District Court unanimously concurred in the view that the corporation did not achieve monopoly, and such is our deduction, and it is against monopoly that the statute is directed, not against an expectation of it, but against its realization, and it is certain that it was not realized. The opposing conditions were underestimated. The power attained was much greater than that possessed by any one competitor—it was not greater than that possessed by all of them. Monopoly, therefore, was not achieved, and competitors had to be persuaded by pools, associations, trade meetings, and through the social form of dinners, all of them, it may be, violations of the law, but transient in their purpose and effect. They were scattered through the years from 1901 (the year of the formation of the corporation) until 1911, but, after instances of success and failure, were abandoned nine months before this suit was brought. There is no evidence that the abandonment was in prophecy of or dread of suit; and the illegal practices have not been resumed, nor is there any evidence of an intention to resume them, and certainly no 'dangerous probability' of their resumption, the test for which Swift & Co. vs. United States, 196 U. S. 396, is cited. It is our conclusion, therefore, as it was that of the judges below, that the practices were abandoned from a conviction of their futility, from the operation of forces that were not understood or were underestimated, and the case is not peculiar. And we may say in passing that the Government cannot fear their resumption, for it did not avail itself of the offer of the District Court to retain jurisdiction of the cause in order that if illegal acts should be attempted they could be restrained.

"What then can now be urged against the corporation? Can comparisons in other regards be made with its competitors and by such comparisons guilty or innocent existence be assigned it? It is greater in size and productive power than any of its competitors, equal or nearly equal to them all, but its power over prices was and is not commensurate with its power to produce.

President Roosevelt's Attitude Praised

"It is true there is some testimony tending to show that the corporation had such power, but there was also testimony and a course of action tending strongly to the contrary. The conflict was by the judges of the District Court unanimously resolved against the existence of that power, and in doing so they but gave effect to the greater weight of the evidence. It is certain that no such power was exerted. On the contrary, the only attempt at a fixation of prices was, as already said, through an appeal to and confederation with competitors, and the record shows besides that when competition occurred it was not in pretence, and the corporation declined in productive powers—the competitors growing either against or in consequence of the competition. If against the competition we have an instance of movement against what the Government insists was an irresistible force; if in consequence of competition we have an illustration of the adage that 'competition is the life of trade' and is not easily repressed. The power of monopoly in the corporation under either illustration is an untenable accusation.

"We may pause here for a moment to notice illustrations of the Government of the purpose of the corporation, instancing its acquisition after its formation of control over the Shelby Steel Tube Co., the Union Steel Co., and, subsequently, the Tennessee company. There is dispute over the reasons for these acquisitions which we shall not detail. There is, however, an important circumstance in connection with that of the Tennessee company which is worthy to be noted. It was submitted to President Roosevelt and he gave it his approval. His approval, of course, did not make it legal, but it gives assurance of its legality, and we know from his earnestness in the public welfare he would have approved of nothing that had even a tendency to its detriment. And he testified he was not deceived and that he believed that 'the Tennessee Coal and Iron people had a property which was almost worthless in their hands, nearly worthless to them, nearly worthless to the communities in which it was situated, and entirely worthless to any financial institution that had the securities the minute that any panic came, and that the only way to give value to it was to put it in the hands of people whose possession of it would be a guaranty that there was value to it.' Such being the emergency, it seems like an extreme accusation to say that the corporation which relieved it, and, perhaps, rescued the company and the communities dependent upon it from disaster, was urged by unworthy motives. Did illegality attach afterward and how? And what was the corporation to do with the property? Let it decay in desuetude or develop its capabilities and resources? In the development, of course, there would be profit to the corporation, but there would be profit as well to the world. For this reason President Roosevelt sanctioned the purchase, and it would seem a distempered view of purchase and result to regard them as violations of law.

"From this digression we return to the consideration of the conduct of the corporation to its competitors. Besides the circumstances which we have mentioned there are others of probative strength. The company's officers and, as well, its competitors and customers, testified that its competition was genuine, direct and vigorous, and was rejected in prices and production. No practical witness was produced by the Government in opposition. Its contention is based on the asserted size and dominance of the corporation—alleged power for evil, not the exertion of the power in evil. Or as counsel put it, 'a combination may be il-

legal because of its purpose; it may be illegal because it acquires a dominating power, not as a result of normal growth and development, but as a result of a combination of competitors.' Such composition and its resulting power constitute, in the view of the Government, the offense against the law, and yet it is admitted 'no competitor came forward and said he had to accept the Steel Corporation's prices.' But this absence of complaint counsel urge against the corporation. Competitors, it is said, followed the corporation's prices because they made money by the imitation. Indeed the imitation is urged as an evidence of the corporation's power. 'Universal imitation,' counsel assert, is 'an evidence of power.' In this concord of action, the contention is, there is the sinister dominance of the corporation—'its extensive control of the industry is such that the others [independent companies] follow.' Counsel, however, admit that there was 'occasionally' some competition, but rejects the suggestion that it extended practically to a war between the corporation and the independents. Counsel say, 'They [the corporation is made a plural] called a few—they called 200 witnesses out of some 40,000 customers, and they expect with that customer evidence to overcome the whole train of price movement shown since the corporation was formed.' And by 'movement of prices,' counsel explained, 'as shown by the published prices . . . they were the ones that the competitors were maintaining all during the interval.'

"It would seem that '200' witnesses would be fairly representative. Besides the balance of the '40,000 customers' was open to the Government to draw upon. Not having done so, is it not permissible to infer that none would testify to the existence of the influence that the Government asserts? At any rate, not one was called, but instead the opinion of an editor of a trade journal is adduced, and that of an author and teacher of economics whose philosophical deductions had, perhaps, fortification from experience as Deputy Commissioner of Corporations and as an employee in the Bureau of Corporations. His deduction was that when prices are constant through a definite period an artificial influence is indicated; if they vary during such a period it is a consequence of competitive conditions.

"It has become an aphorism that there is some danger of deception in generalities, and in a case of this importance we should have something surer for judgment than speculation, something more than a deduction equivocal of itself even though the facts it rests on or asserts were not contradicted. If the phenomena of production and prices were as easily resolved as the witness implied, much discussion and much literature have been wasted, and some of the problems that are now distracting the world would be given composing solution. Of course competition affects prices, but it is only one among other influences and does not more than they register itself in definite and legible effect.

"We magnify the testimony by its consideration. Against it competitors, dealers and customers of the corporation testify in multitude that no adventitious interference was employed to either fix or maintain prices and that they were constant or varied according to natural conditions. Can this testimony be minimized or dismissed by inferring that, as intimated, it is an evidence of power not of weakness, and power exerted not only to suppress competition but to compel testimony, is the necessary inference, shading into perjury to deny its exertion? The situation is indeed singular, and we may wonder at it, wonder that the despotism of the corporation, so baneful to the world in the representation of the Government, did not produce protesting victims.

Government Presents Contradictions

"But there are other paradoxes. The Government does not hesitate to present contradictions, though only one can be true, such being we were told in our school books the 'principle of contradiction.' In one competitors (the independents) are represented as oppressed by the superior power of the corporation; in the other they are represented as ascending to opulence by imitating that power's prices which they could not do if at disadvantage from the other conditions of competition, and yet confederated action is not asserted. If it were, this suit would take on another cast. The competitors would cease to be the victims of the corporation and would become its accomplices. And there is no other alternative. The suggestion that lurks in the Government's contention that the acceptance of the corporation's prices is the submission of impotence to irresistible power is, in view of the testimony of the competitors, untenable. They, as we have seen, deny restraint in any measure or illegal influence of any kind. The Government, therefore, is reduced to the assertion that the size of the corporation, the power it may have, not the exertion of the power, is an abhorrence to the law, or, as the Government says, 'the combination embodied in the corporation unduly restrains competition by its *necessary effect*, [the italics are the emphasis of the Government], and therefore is unlawful regardless of purpose.' 'A wrongful purpose,' the Government adds, is 'matter of aggravation.' The illegality is statical, purpose or movement of any kind only its emphasis. To assent to that, to what extremes would we be led? Competition consists of business activities and ability—they make its life; but there may be fatalities in it. Are the activities to be encouraged when militant and suppressed or regulated when triumphant because of the dominance attained? To such paternalism the Government's contention, which regards power rather than its use the determining consideration, seems to conduct. Certainly conducts we may say, for it is the inevitable logic of the Government's contention that competition must not only be free, but that it must not be pressed to the ascendency of a competitor, for in ascendency there is the menace of monopoly.

"We have pointed out that there are several of the Government's contentions which are difficult to represent or measure, and, the one we are now considering, that is the power is unlawful regardless of purpose, is another of them. It seems to us that it has for its ultimate principle and justification that strength in any producer or seller is a menace to the public interest and illegal because there is potency in it for mischief. The regression is extreme but short of it the Government cannot stop. The fallacy it conveys is manifest.

"The corporation was formed in 1901, no act of aggression upon its competitors is charged against it, it confederated with them at times in offense against the law, but abandoned that before this suit was brought, and since 1911 no act in violation of law can be established against it except its existence be such an act. This is urged, as we have seen, and that the interest of the public is involved, and that such interest is paramount to corporation or competitors. Granted —though it is difficult to see how there can be restraint of trade when there is no restraint of competitors in the trade nor complaints by customers—how can it be worked out of the situation and through what proposition of law? Of course it calls for nothing other than a right application of the law and to repeat what we have said above, shall we declare the law to be that size is an offense even though it minds its own business because what it does is imitated? The corporation is undoubtedly of impressive size and it takes an effort of resolution not to be affected by it or to exaggerate its influence. But we must adhere to the law and the law does not make mere size an offense or the existence of unexerted power an offense. It, we repeat, requires overt acts and trusts to its prohibition of them and its power to repress or punish them. It does not compel competition nor require all that is possible.

"Admitting, however, that there is pertinent strength

in the propositions of the Government, and in connection with them, we recall the distinction we made in the *Standard Oil* case (221 U. S. 1, 77) between acts done in violation of the statue and a condition brought about which in and of itself, is not only a continued attempt to monopolize, but also a monopolization. In such case, we declared, the duty to inforce the statute required the application of broader and more controlling remedies than the other. And the remedies applied conformed to the declaration; there was prohibition of future acts and there was dissolution of the combination found to exist in violation of the statute in order to neutralize the extension and continually operating force which the possession of the power unlawfully obtained had brought about.

"Are the case and its precepts applicable here? The Steel Corporation by its formation united under one control competing companies and thus, it is urged, a condition was brought about in violation of the statute, and therefore illegal and became a continually operating force with the possession of power unlawfully obtained.

Evil at Home but Good for Foreign Trade

"But there are countervailing considerations. We have seen whatever there was of wrong intent could not be executed, whatever there was of evil effect—was discontinud before this suit was brought and this, we think, determines the decree. We say this in full realization of the requirements of the law. It is clear in its denunciation of monopolies and equally clear in its direction that the courts of the Nation shall prevent and restrain them (its language is to prevent and restrain violations of the act) but the command is necessarily submissive to the conditions which may exist and the usual powers of a court of equity to adapt its remedies to those conditions. In other words, it is not expected to enforce abstractions or do injury thereby, it may be, to the purpose of the law. It is this flexibility of discretion—indeed essential function—that makes its value in our jurisprudence—value in this case as in others. We do not mean to say that the law is not its own measure and that it can be disregarded, but only that the appropriate relief in each instance is remitted to a court of equity to determine, not, and let us be explicit in this, to advance a policy contrary to that of the law, but in submission to the law and its policy, and in execution of both. And it is certainly a matter for consideration that there was no legal attack on the corporation until 1911, 10 years after its formation and the commencement of its career. We do not, however, speak of the delay simply as to its time or that there is estoppel in it because of its time, but on account of what was done during that time—the many millions of dollars spent, the development made, and the enterprises undertaken, the investments by the public that have been invited and are not to be ignored. And what of the foreign trade that has been developed and exists? The Government, wtih some inconsistency, it seems to us, would remove this from the decree of dissolution. Indeed, it is pointed out that under Congressional legislation in the Webb act the foreign trade of the corporation is reserved to it. And further, it is said, that the corporation has constructed a company called the Products company which can be very easily preserved as a medium through which the steel business might reach the balance of the world, and that in the decree of dissolution that could be provided. This is supplemented by the suggestion that not only the Steel Corporation, but other steel makers of the country, could function through an instrumentality created under the Webb act.

"The propositions and suggestions do not commend themselves. We do not see how the Steel Corporation can be such a beneficial instrumentality in the trade of the world and its beneficence preserved, and yet be such an evil instrumentality in the trade of the United States that it must be destroyed. And by whom and how shall all the adjustments of preservation or destruction be made? How can the corporation be sustained and its power of control over its subsidiary companies be retained and exercised in the foreign trade and given up in the domestic trade? The Government presents no solution of the problem. Counsel realize the difficulty and seem to think that its solution or its evasion is in the suggestion that the Steel Corporation and other steel makers could function through an instrumentality created under the Webb act. But we are confronted with the necessity of immediate judicial action under existing laws, not action under laws that have not been and may not be enacted.

"The Government, however, tentatively presents a proposition which has some tangibility. It submits that certain of the subsidiary companies are so mechanically equipped and so officially directed as to be released and remitted to independent action and individual interests and the competition to which such interests prompt, without any disturbance to business. The companies are enumerated. They are the Carnegie Steel Co. (a combination of the old Carnegie Co., the National Steel Co., and the American Steel Co.), the Federal Steel Co., the Tennessee company and the Union Steel Co. (a combination of the Union Steel Co. of Donora, Pa., Sharon Steel Co. of Sharon, Pa., and Sharon Tin Plate Co.). They are fully integrated. it is said, possess their own supplies, facilities of transportation and distribution. They are subject only to the Steel Corporation, in effect, is the declaration, in nothing but its control of their prices. We may say parenthetically that they are defendants in the suit and charged as offenders, and we have the strange circumstance of violators of the law being urged to be used as expedients of the law.

Corporation and Other Companies Contrasted

"But let us see what guide to a procedure of dissolution of the corporation and the dispersion as well of its subsidiary companies, for they are asserted to be illegal combinations, is prayed. And the fact must not be overlooked or underestimated. The prayer of the Government calls for not only a disruption of present conditions but the restoration of the conditions of 20 years ago, if not literally, substantially. Is there guidance to this in the Standard Oil case and the Tobacco case? As an element in determining the answer we shall have to compare the cases with that at bar, but this can only be done in a general way. And the law necessarily must be kept in mind. No other comment of it is necessary. It has received so much exposition that it and all it prescribes and proscribes should be considered as a consciously directing presence.

"The Standard Oil Co. had its origin in 1882 and through successive forms of combinations and agencies it progressed in illegal power to the day of the decree, even attempting to circumvent by one of its forms the decision of a court against it. And its methods in using its power was of the kind that Judge Woolley described as 'brutal', and of which practices, he said, the Steel Corporation was absolutely guiltless. We have enumerated them and this reference to them is enough. And of the practices this court said no disinterested mind could doubt that the purpose was to drive others from the field and to exclude them from their right to trade and thus accomplish the mastery which was the end in view. It was further said that what was done and the final culmination in the plant of the New Jersey corporation made manifest the continued existence of the intent . . . and impelled the expansion of the New Jersey corporation. It was to this corporation which represented the power and

purpose of all that preceded, that the suit was addressed and the decree of the court was to apply. What we have quoted contrasts that case with this. The contrast is further emphasized by pointing out how in the case of the New Jersey corporation the original wrong was reflected in and manifested by the acts which followed the organization, as described by the court. It said: The exercise of the power which resulted from that organization fortifies the foregoing conclusions (as to monopoly, etc.), since the development which came, the acquisition here and there which ensued of every efficient means by which competition could have been asserted, the slow but resistless methods which followed by which means of transportation were absorbed and brought under control, the system of marketing which was adopted, by which the country was divided into districts and the trade in each district in oil was turned over to the designated corporation within the combination and all others were excluded, all lead the mind up to a conviction of a purpose and intent which we think is so certain as practically to cause the subject not to be within the domain of reasonable contention.

"The Tobacco company case has the same bad distinctions as the Standard Oil case. The illegality in which it was formed [there were two American Tobacco Companies, but we use the name as designating the new company as representing the combinations of the suit] continued, indeed progressed in intensity and defiance to the moment of decree. And it is the intimation of the opinion if not its direct assertion that the formation of the company (the word combination is used) was preceded by the intimidation of a trade war inspired by one or more of the minds which brought about and became parties to that combination. In other words, the purpose of the combination was signalled to competitors and the choice presented to them was submission or ruin, to become parties to the illegal enterprise or be driven out of the business. This was the purpose and the achievement, and the processes by which achieved, this court enumerated to be the formation of new companies, taking stock in others to obscure the result actually attained, but always to monopolize and retain power in the hands of the few and mastery of the trade; putting control in the hands of seemingly independent corporations as barriers to the entry of others into the trade; the expenditure of millions upon millions in buying out plants not to utilize them but to close them; by constantly recurring stipulations by which numbers of persons, whether manufacturers, stockholders or employees, were required to bind themselves, generally for long periods, not to compete in the future. In the Tobacco case, therefore, as in the Standard Oil case, the court had to deal with a persistent and systematic lawbreaker masquerading under legal forms, and which not only had to be stripped of its disguises but arrested in its illegality. A decree of dissolution was the manifest instrumentality and inevitable. We think it would be a work of sheer supererogation to point out that a decree in that case or in the Standard Oil case furnishes no example for a decree in this.

"In conclusion we are unable to see that the public interest will be served by yielding to the contention of the Government respecting the dissolution of the company or the separation from it of some of its subsidiaries; and we do see in a contrary conclusion a risk of injury to the public interest, including a material disturbance of, and, it may be serious detriment to, the foreign trade. And in submission to the policy of the law and its fortifying prohibitions the public interest is of paramount regard.

"We think, therefore, that the decree of the District Court should be affirmed."

Dissenting Opinion of Three Justices

Justice Day Declares No Public Policy Sanctions Violation of the Law. Vigorous Condemnation of the Corporation

Justice Day, who with Justices Pitney and Clarke, dissented, said:

"This record seems to me to leave no fair room for a doubt that the defendants, the United States Steel Corporation, and the several subsidiary corporations which make up that organization, were formed in violation of the Sherman act. I am unable to accept the conclusion which directs a dismissal of the bill instead of following the well-settled practice, sanctioned by the previous decisions of this court, requiring the dissolution of combinations made in direct violation of the law.

"It appears to be thoroughly established that the formation of the corporations, here under consideration, constitutes combinations between competitors in violation of law, and intended to remove competition and to directly restrain trade. I agree with the conclusions or Judges Woolley and Hunt expressed in the court below that the combinations were not submissions to business conditions, but were designed to control them for illegal purposes, regardless of other consequences, and 'were made upon a scale that was huge and in a manner that was wild,' and 'properties were assembled and combined with less regard to their importance as integral parts of an integrated whole than to the advantages expected from the elimination of the competition which theretofore existed between them.' Those judges found that the constituent companies of the United States Steel Corporation, nine in number, were in themselves combinations of steel manufacturers and the effect of the organization of these combinations was to give a control over the industry at least equal to that theretofore possessed by the constituent companies and their subsidiaries.

Enormous Over-capitalization

"'That the Steel Corporation was a combination of combinations by which directly or indirectly 180 independent concerns were brought under one control.' The enormous over-capitalization of companies and the appropriation of $100,000,000 in stock to promotion expenses were represented in the stock issues of new organizations thus formed, and were the basis upon which large dividends have been declared from the profits of the business. This record shows that the power obtained by the corporation brought under its control large competing companies which were of themselves illegal combinations, and succeeded to their power; that some of the organizers of the Steel Corporation were parties to the preceding combinations, particularly in their illegality, and by uniting them under a common direction, intended to augment and perpetuate their power. It is the irresistible conclusion from these premises that great profits to be derived from unified control were the object of these organizations.

"The contention must be rejected that the combination was an inevitable evolution of industrial tendencies compelling union of endeavor. Nothing could add to the vivid accuracy with which Judge Woolley, speaking for himself and Judge Hunt, has stated the illegality of the organization, and its purpose to combine in one great corporation the previous combinations by a direct violation of the purposes and terms of the Sherman act.

Pools and Gary Dinners

"For many years, as the record discloses, this unlawful organization exerted its power to control and maintain prices by pools, associations, trade meetings and as the result of discussion and agreements at the so-called "Gary dinners," where the assembled trade opponents secured co-operation and joint action through the machinery of special committees of competing concerns, and by prudent pre-vision took into account the possibility of defection and the means of

Judge Gary's Comment on the Decision of the Court

Judge Elbert H. Gary, chairman of the board of the United States Steel Corporation, issued the following statement in regard to the decision:

"All the members of the organization of the United States Steel Corporation and its subsidiaries are, of course, much gratified by the decision of the Supreme Court of the United States, which, as I understand, holds that the corporation was not in itself an organization in violation of the Sherman Act, and in general affirms the decision of the Circuit Court of Appeals.

"Those of us who were intimately connected with the creation of the corporation, and with its principles and policies from that time until the present, have never doubted that the final decision in the case ought to be in its favor. There has never been any intention on our part to violate the Sherman law.

"It has been our endeavor to be of real benefit to our employees, our customers, our competitors and especially to the general public, and to be of injury to no one. That we may have failed in some respects is quite possible.

"The fact that a minority opinion, indorsed by three able judges, was filed in the case emphasizes the necessity on the part of industrial managers to observe the requirements of all statutory provisions and to keep constantly in mind the rights and interests of the public.

"I think from the beginning sentiment has generally been favorable to the corporation, and, if so, it is because we have taken pains to publish the facts concerning our management, our conditions and our intentions.

"A decree of dissolution would have been a calamity. It would seriously have interfered with industrial progress and prosperity. The decision, as made, will immeasurably add to the general feeling of confidence in the value of property and in the opportunities of business enterprise."

controlling and perpetuating that industrial harmony which arose from the control and maintenance of prices.

"It inevitably follows that the corporation violated the law in its formation and by its immediate practices. The power thus obtained from the combination of resources almost unlimited in the aggregation of competing organizations, had within its control the domination of the trade and the ability to fix prices and restrain the free flow of commerce upon a scale heretofore unapproached in the history of corporate organization in this country.

"These facts established, as it seems to me they are by the record, it follows that if the Sherman act is to be given efficacy, there must be a decree undoing so far as is possible that which has been achieved in open, notorious and continued violation of the provisions.

Mere Size Not the Point

"I agree that this offers no objection to the mere size of a corporation, nor to the continued exertion of its lawful power, when that size and power have been obtained by lawful means and developed by natural growth, although its resources, capital and strength may give to such corporation a dominating place in the business and industry with which it is concerned. It is entitled to maintain its size and the power that legitimately goes with it, provided no law has been transgressed in attaining it. But I understand the reiterated decisions of this court construing the Sherman act to hold that this power may not legally be derived from conspiracies, combinations, or contracts in restraint of trade. To permit this would be to practically annul the Sherman law by judicial decree. This principle has been so often declared by the decisions that it is only necessary to refer to some of them. It is the scope of such combinations and their power to stifle and suppress competition and create or tend to create monopolies, which, as we have declared so often as to make its reiteration monotonous, was the purpose of the Sherman act to condemn, including all combinations and conspiracies to restrain the free and natural flow of trade in the channels of interstate commerce. While it was not the purpose of the act to condemn normal and usual contracts, to lawfully expand business and furnish legitimate trade, it did intend to effectively reach and control all conspiracies and combinations or contracts of whatever form which unduly restrain competition and unduly obstruct the natural course of trade, or which, from their nature or effect have proved effective to restrain interstate commerce.

"This statute has been enforced for nearly 40 years. It has been frequently before the court for consideration, and the nature and character of the relief to be granted against combinations found guilty of violations of it have been the subject of much consideration. Its interpretation has become a part of the law itself, and if changes are to be made now in its construction and operation, it seems to me that exertion of such authority rests with Congress and not with the courts.

Standard Oil and Tobacco Cases

"The fourth section is intended to give to courts of equity of the United States the power to effectively control and restrain violations of the act. In none of the cases which have been before the courts was the character of the relief to be granted where organizations were found to be within the condemnation of the act more thoroughly considered than in the Standard Oil and the Tobacco company cases. In the former's case, considering the measure of relief to be granted in the case of a combination, certainly not more obnoxious to the Sherman act than the court now finds the one under consideration to be, this court declared that it must be two-fold in character; first, to forbid the doing in the future of acts like those which we have found to have been done in the past, which would be violative of the statutes. Second, the exertion of such measure of relief as will effectively dissolve the combination found to exist in violation of the statute and thus neutralize the extension and continually operating force which the possession of the power unlawfully obtained has brought and will continue to bring about.

"In the American Tobacco Co. case, the nature of the relief to be granted was again given consideration, and it was there concluded that the only effectual remedy was to dissolve the combination and the companies comprising it, and for that purpose the cause was remanded to the district court to determine a method of dissolution and of recreating from the elements composing it 'a new condition which should be in honest harmony with and not repugnant to the law.' In that case the corporations dissolved had long been in existence and the offending companies were organized years before the suit was brought and before the decree of dissolution was finally made. Such facts were considered no valid objection to the dissolution of these powerful organizations as the only effective means of enforcing the purposes of the anti-trust act. These cases have been frequently followed in this court and in the lower federal courts in determining the nature of relief to be granted, and I see no occasion to depart from them now.

Plain Violation Admitted

"As I understand the conclusions of the court, affirming the decree directing dismissal of the bill, they amount to this: That these combinations, both the holding company and the subsidiaries, although organ-

ized in plain violation of the act, nevertheless are immune from a decree effectually ending the combinations and putting it out of their power to attain the unlawful purposes sought, because of some reasons of public policy requiring such conclusions. I know of no public policy that sanctions a violation of the law, nor of any inconvenience to trade, domestic or foreign, which should have the effect of placing combinations in defiance of the law forbidding such combinations. Such a conclusion does violence to the policy which the law was intended to enforce, runs counter to the decisions of the court and necessarily results in a practical nullification of the act.

"There is no mistaking the terms of the act as they have hitherto been interpreted by this court. It was intended to merely suppress unfair practices, but as its history and terms amply show it was intended to make it criminal to form combinations or engage in conspiracies or contracts in restraint of interstate trade. The remedy by injunction at the instance of the Attorney-General was given to enable the courts to prohibit such conspiracies, etc., and this court, interpreting its provisions, has held that the proper inforcement of the act requires decrees to end combinations by dissolving them and restoring as far as possible competitive conditions. I am unable to see force in the suggestion that public policy or the assumed disastrous effect upon foreign trade is sufficient to entitle the combination to immunity. Nor can I yield assent to the proposition that this combination has not acquired a dominant position in the trade enabling it to control prices and production when it sees fit to exert its power. Its total assets Dec. 31, 1913, exceeded $1,800,000,000; its outstanding capital stock was $868,583,600; its surplus, $151,798,428. Its cash on hand ordinarily was $75,000,000; this sum alone exceeded the total capitalization of any one of its competitors and with a single exception, the total capitalization and surplus of any one of them. That such an organization thus fortified and equipped could, if it saw fit, dominate the trade would seem too plain to require argument. Its resources, strength and comprehensive ownership of the means of production enable it to adopt measures to again, as in the past, effectually dominate and control the steel business. From the earliest decisions of this court it has been declared that it was the effective power of such organizations to control and restrain competition and the freedom of trade that Congress intended to limit and control. That the exercise of the power may be withheld, or exerted with forbearing benevolence does not place such combinations beyond the authority of the statute which was intended to prohibit their formation and when formed to deprive them of the power unlawfully attained.

Was There Monopolization?

"It is said that a complete monopolization of the steel business was never attained. To insist upon such results would be beyond the requirements of the statute and in most cases practically impossible. It is affirmed that to grant the Government a decree of dissolution would not result in a change of the conditions in the steel trade. Such is not the theory of the Sherman act. That act was framed in the belief that attempted or accomplished monopolizations or combinations which suppressed free competition were hurtful to the public interest and that a restoration of competitive conditions would benefit the public. We have here a combination in control of one-half the steel business. If the plan were followed as in the Tobacco case, of remanding the case to the district court, a decree might be framed restoring the competitive conditions as far as practicable.

"In that case the subject of reconstruction so as to restore such conditions was elaborated upon and carefully considered.

"In my judgment the principles there laid down, if followed now, would make a very material difference in the steel industry. Instead of one dominating corporation with scattered competition there would be competitive conditions throughout the whole trade, which would carry into effect the policy of the law.

"It seems to me that if this act is to be given effect, the bill under the finding of fact made by the court should not be dismissed and the cause should be remanded to the district court, where a plan of effective and final dissolution should be enforced by a decree framed for that purpose."

Iron Age Index of Main Events in the Suit for Dissolution

Dissolution suit is filed against corporation at Trenton, N. J., Oct. 26, 1911.—IRON AGE, Nov. 2, '11, page 952.

Corporation on Oct. 26 resolves to surrender Great Northern ore lease Jan. 1, 1915, and reduce rates on its ore railroads.—IRON AGE, Nov. 2, '11, page 952.

Judge Gary issues statement Oct. 27, 1911.—IRON AGE, Nov. 2, '11, page 956.

Corporation files its answer Jan. 31, 1912.—IRON AGE, Feb. 1, 1912, page 302.

Government fails to indict steel officials.—IRON AGE, April 18, '12, page 987.

Taking of testimony begins in New York May 6, 1912.—IRON AGE, May 16, '12, page 1241.

Hearings, adjourned in New York June 19, 1912, are resumed in Pittsburgh Oct. 1.—IRON AGE, Oct. 10, '12, page 872.

Hearings in Washington.—IRON AGE, Nov. 28, '12, page 1281.

Attorney General petitions for dissolution of corporation.—IRON AGE, Feb. 6, '13, page 380.

Representative Levy introduces resolution to stop all proceedings against the corporation Sept. 2, 1913.—IRON AGE, Sept. 4, '13, page 535.

Hearings held in South in January, 1914.—IRON AGE, Jan. 15, '14, page 230.

Hearings in Chicago Jan. 21, 1914.—IRON AGE, Jan. 29, '14, page 321.

Hearings resumed in New York Feb. 2, 1914.—IRON AGE, Feb. 5, '14, page 402.

Briefs filed about Oct. 1, 1914.—IRON AGE, Oct. 15, '14, page 915.

Oral arguments before the U. S. Circuit Court of Appeals, Philadelphia, from Oct. 20 to 29, 1914.—IRON AGE, Oct. 22, page 951; Oct. 29, page 1024 and Nov. 5, page 1080.

Circuit Court decides in favor of the corporation June 3, 1915.—IRON AGE, June 10, '15, page 1299.

Government dockets appeal from lower court decision in Supreme Court the last of October, 1915.—IRON AGE, Oct. 28, '15, page 1023.

Supreme Court orders entire record to be certified up to the court by May 20, 1916.—IRON AGE, March 23, '16, page 732.

Plaintiff and defendant file briefs: Government on Feb. 16, '17, and corporation on March 3, '17.—IRON AGE, Feb. 22, '17, page 496, and March 8, '17, page 607.

Oral arguments before Supreme Court begin March 9, 1917.—IRON AGE, March 15, '17, page 660.

Supreme Court assigns case for re-arguing in October, 1917.—IRON AGE, May 24, '17, page 1289.

Government arranges another postponement lest final dissolution, with attendant refinancing of dissolved companies, divert capital from war loans.—IRON AGE, Jan. 10, '18, page 146.

Hearings resumed Oct. 8, 1919, before Supreme Court.

Corporation declared not a trust on March 1, 1920.—IRON AGE, March 4, page 670.

AROUSED BY TRADE CHECK

Numerous Resolutions Urging Full Appropriations for Department of Commerce

The proposed 65 per cent reduction in the appropriation for the Bureau of Foreign and Domestic Commerce, cutting the sum requested, $1,833,190 to $623,670 has aroused hundreds of trade organizations, export associations and Chambers of Commerce to action. Resolutions have been passed by most of the large organizations and numerous individuals have wired and written their congressmen protesting against the reduction, concerted action by trade organizations having been taken Feb. 27, at the India House, New York, where, under the auspices of the National Foreign Trade Council, a conference of 18 associations was held, resolutions passed and a committee appointed to go to Washington, to bring pressure on the Senate and House committees for the restoration of all the items originally contained in the estimate of the Department of Commerce. The committee also has instructions to get in touch with organizations of farmers, business men and labor to secure concerted action. Opposition is expected from the State Department, which favors absorption of this branch of the service in the duties of the Department of State. The proposed cut not only eliminates commercial attaches whose reports in the past have been used extensively by concerns in all lines of industry, but it would reduce the force of the bureau at Washington by about one half.

At the conference called by the National Foreign Trade Council, resolutions were passed pointing out the menace such a reduction would be to foreign trade, the services rendered by the bureau and the fact that Great Britain maintains a similar service.

At the convention of the Material Handling Machinery Manufacturers Association, Feb. 26-27, at the Waldorf-Astoria Hotel, New York, the question of the proposed reduction was presented to the members by their president, Calvin Tomkins, and unanimous action immediately taken on it.

Material Handling Machinery Manufacturers Hold Convention

The two-day convention of the Material Handling Machinery Manufacturers' Association at the Waldorf-Astoria Hotel, Feb. 26 and 27, was well attended at all sessions, particularly at the luncheon, when about 150 representatives of concerns manufacturing cranes, tractors, trucks and electric conveyors were present. In a short address introducing the speakers, Calvin Tomkins, president of the association, pointed out the necessity of overcoming the objections of labor to labor-saving devices, and the value of obtaining recognition of their industry. He said that there is a great field opening for mechanical handling, as electricity is coming to be universally used in factories and terminals. Applied to the present inability of the railroads to move large supplies of raw materials, Mr. Tomkins said that a more general use of machinery would at least partially offset the present car shortage. But although railroad terminals are installing labor-saving machinery for moving freight, it is in the factories and mills of the country that mechanical handling is making the greatest strides.

Arthur E. Harrell of the *New York Tribune*, speaking on "Americanism and Business," brought out the need for co-operative effort on the part of manufacturers to work with employees, in order to offset un-American propaganda. A paper that aroused great interest was read by B. E. Fitch, president of the Motor Terminals Co., New York and Cleveland, which described the new freight handling terminal at Cincinnati. Mr. Fitch showed a number of stereopticon slides of the cranes and trucks at the terminal in operation. Several interesting facts were presented to the advertising managers of manufacturers, by A. J. Barnes, Shepard Electric Crane & Hoist Co. Mr. Barnes said that an investigation had showed that there is an actual demand for 214,464 industrial units in the industrial field alone. The research showed also that fully 65 per cent of the manufacturers of the country are unfamiliar with the details of even minor types of material handling machinery. The speech by A. R. Smith, editor of *Marine News*, severely criticized New York's lack of modern methods in loading and discharging cargoes. Mr. Smith pointed out that methods of handling freight at the Port of New York not only make it one of the most expensive in the world but threaten in time to be the cause of diverting a large part of its business to other ports with more modern facilities. Following each session of the convention, motion pictures of mechanical handling machinery in action were exhibited.

Among the manufacturers of material handling machinery represented at the luncheon were: J. W. Spensley, Champion Engineering Co., Kenton, Ohio; R. K. Stockwell, Robins Conveying Belt Co., New York; Henry W. Standart, Northern Engineering Works, Detroit; Roy W. Hurst, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; R. W. Scott, Otis Elevator Co., New York; George B. Green, East Waterway Dock & Warehouse Co., Seattle, Wash.; A. R. Scanlon, Chicago Pneumatic Tool Co., Chicago; F. R. Fishback, Electric Controller & Mfg. Co., Cleveland; Peter Olson, Samuel Olson & Co., Chicago; John Hayward, the Hayward Co., New York; Thomas Robins, Robins Conveying Belt Co., New York; W. E. Wenz, Portable Machinery Co., Passaic, N. J.; W. B. Clark, Manning, Maxwell & Moore, New York; C. R. Rudinger, Victor R. Browning Co., New York; Hjalmar E. Skouger, consulting engineer, New York; Fred Stadelman, Wellman-Seaver-Morgan Co., Cleveland; Justin Griess, McMyler Interstate Co., Bedford, Ohio; J. O. Bradney, Bradney Machine Co., Middletown, N. Y.; R. H. McLain, General Electric Co., Schenectady, N. Y.

Uncertainty as to Coke Control

WASHINGTON, March 2.—Return of the railroads to private control has resulted in issuance of new orders relating to fuel control. The orders, however, as yet do not clear up the uncertainties which have been in effect the past few months as to coal and coke prices.

President Wilson issued an executive order continuing the powers of Fuel Administrator vested in the Director General of Railroads, under Walker D. Hines. This order simply continues Mr. Hines as the authority for domestic distribution which was transferred to him by former Fuel Administrator Garfield at the time of the coal strike in November. The order does not give Mr. Hines any control over prices.

Another executive order authorizes a commission, composed of A. W. Howe, Rembrandt Peale, F. M. Whitaker and J. F. Fisher, to take control over bunker and export coal matters. This commission will function through the Tidewater Coal Exchange, which is restored for that purpose, having been suspended upon the resignation of Mr. Garfield as fuel administrator. The order creating the commission is effective until April 30, which would indicate that the Administration contemplates lifting its coal restriction at that time. The order said the action was taken "because of the present emergency and in order to secure an adequate supply and equitable distribution, to facilitate the movement, and to prevent local or a general scarcity of coal." The order directs the commission to exercise jurisdiction "relative to tidewater transmission of coal to Hampton Roads, Baltimore, Philadelphia and New York."

Suit was instituted during the past week to enjoin Director General Hines from continuing control over the distribution of coal. The suit was filed in the name of the United Illuminating Co. of New Haven, Conn., with the backing of coal interests.

An examination for inspector of structural steel erection to fill vacancies at the Naval Air Station, Lakehurst, N. J., and elsewhere, at $8.80 per day will be held by the U. S. Civil Service Commission April 6. No fixed examination will be held, but competitors will be rated on the scale of 100, 30 points for education and general experience and 70 points for special experience and fitness.

Metric Chaos In Daily Life

A Staggering Program of Overturning for Industry and the Individual

Not since the free silver craze of 1896 with its 16 to 1 formula, which was to become operative "without the consent of any other nation," has a national policy been urged upon the country with a tithe of the possibilities of chaos in business that are involved in the compulsory adoption of the metric system. What it would mean in matters affecting the everyday life of the average member of the community is suggested in the following, which is contributed to the current discussion by a well-known testing engineer:

What the Metric System Would Mean in Some Ordinary Affairs

In domestic life:

Grocers' scales all require new poise weights, all notched balance beams scrapped and new ones provided, with new sliding weights.

Peck and bushel measures discarded.

Litre larger than a quart, new containers required.

Hectolitre, equal to 2.8 bushels, not a practical unit.

Prices on all commodities to be readjusted to new units.

In culinary matters:

All recipes to be readjusted to kilogrammes and litres; cook books to be rewritten; general confusion in kitchen operations.

New milk bottles.

In other household affairs:

Gas meters to be replaced by new system of units of volume, or readings of meters taken in one system and converted into the other, to avoid scrapping meters in use.

Water meters in same category as gas meters.

Tape measures and yard sticks to be discarded.

In shopping:

Counter measuring machines to be reconstructed, yards to metres.

Dry goods to be folded at cotton and woolen mills in metre folds instead of yard folds, requiring change of machinery.

Photographic plates in common sizes to be known by awkward combinations of figures. An 8 by 10 plate becomes 203 by 254 millimetres.

Quires and reams to be displaced by decimal multiples, requiring changes at manufacturing plants.

All containers and cartons to be modified in sizes and shapes to be adapted to new unit sizes.

Shirts, collars and cuffs to be known by strange names of sizes. A 16-in. collar becomes a 406-millimetre collar. A 187-millimetre hat is worn instead of 7⅜ in.

In building materials and construction:

Abandon board measure and substitute square decimeters, centares, or ares.

Doors familiar to all builders as 2 ft. 6 in. by 6 ft. 8 in. become 762 by 2032 millimetres.

An ordinary brick is 51 by 101 by 203 millimetres. Sizes of sash also are converted into strange units. Weights of tin, terne, copper, zinc, lead sheets and plates placed before builders in unknown units, in awkward combinations.

Molds and pallets in brickyards to be changed to new units or inconvenient numbers used to represent sizes.

Earth excavation on basis of cubic metres, representing about 1.3 cu. yd. Designation of shovels and dippers in excavating machinery to be in fractions of cubic metres instead of definite yards.

All architects' drawings to be in new units, involving a most perplexing conversion of current building material units or made up on a system that will involve changes in all woodworking machinery to meet metric units.

In railroad affairs:

Change in position and renumbering of, say, 100,000 mile posts, an incidental and minor affair relative to other changes.

Standard gage of track becomes known as 1435 millimetres.

Changes in timetable mileages.

Books of rules rewritten and speeds given in new units instead of miles per hour. Slow boards all repainted with new speeds thereon.

Speed recorders scrapped or remodeled.

Employees instructed in new methods of estimating speeds.

Dimensions of all wheels, axles, standard parts of car construction changed into new units.

Railroad track and warehouse scales to be reconstructed into metric units. Capacity of cars to be in new units.

In public land surveys.

Lands in many States surveyed and staked out in townships, sections, quarter sections and eighth sections, in none of which divisions is there an easy conversion into metric units.

In reconveyance of lands, present deeds giving metes and bounds in English units would require expensive and elaborate efforts to put dimensions and areas in metric units, which if correctly made would still be unintelligible to most people.

As great as the confusion in the few respects above mentioned and as expensive as the process would be in all the usual affairs of life, these few enumerated examples pale into insignificance beside the cost involved in making the conversion in the manufacturing industries. The cost of the war is but a fraction of that which would confront the general industries of the country. Virtual scrapping of all small tools and fixtures would be faced by manufacturers were such an act of Congress passed.

A colossal fortune in changes of lead screws and screw cutting gears in lathes alone is involved.

In all machinery the changes become of such a staggering nature their mere contemplation is most depressing. Days would be required simply to state the number of changes involved in the industries.

The ravages of war have fixed and definite limits of territory. The ravages of the metric system changes would be universal in domestic affairs.

Compulsory legislation in this matter would plunge the nation into economic disorder, wiping out values in billions of dollars.

A dual system is confusing beyond description. Two systems do not admit of being in common use. A gradual change, piecemeal, is impracticable. A sudden sweeping change would throw the entire country into disorder.

In the chemical laboratory the metric system is used. It is there because it has advantages in chemical work. It was adopted because of its advantages there.

The metric system would be adopted by the industries if it possessed advantages for them.

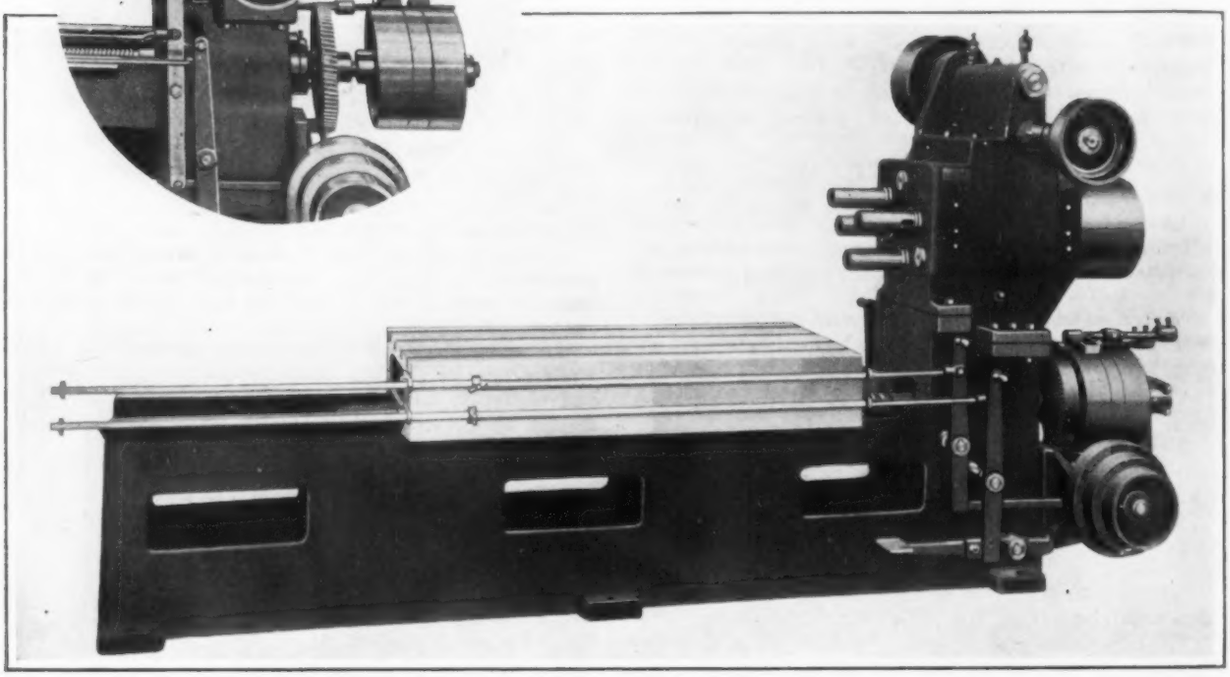
The rewriting of all textbooks, engineers' tables, the changes in architects' drawings, in mechanical drawings, the education of the personnel of machine shops and other industries in the use of a new system of units are matters of greater magnitude than any yet undertaken by this country.

Two Horizontal Boring Machines

The two machines shown in the accompanying illustrations were designed by the Moline Machinery Co., Moline, Ill., for the boring of crank and transmission cases, but they can be used for other operations where a single purpose machine is required.

The No. 4 machine takes a rail and horizontal adjustable heads. It is for use where a series of holes are to be bored and the job can be conveniently tilted to bring all in a horizontal plane.

When two or more holes not in a horizontal plane are to be bored, the No. 5 machine is preferable. This is equipped with a group spindle head properly spaced and geared to meet individual requirements. The spindles are not adjustable in this case. The entire head mechanism is run in an oil bath and is spiral driven, thus to insure a smooth and powerful drive.



Horizontal Machines for Boring Cranks and Transmission Cases, or for Other Operations Where a Single Purpose Machine Is Required. The No. 5 machine is shown below. The table and bed of the No. 4 machine, shown in the insert, are similar to those of the other machine

Both machines are built standard up to the rail or head. The housing is emphasized as being heavy and well ribbed. The table is tee slotted and has a narrow guide on the housing with a wide surface bearing. A two-speed countershaft is furnished, giving two speeds to the spindles. The table has three positive feeds against the spindles and has rapid traverse in both directions. The two feeds are interlocking, thus to eliminate danger of both being engaged at the same time. All speeds and feeds are varied to meet individual requirements. A feature is the double control of all levers, enabling the operator to stand on either side of the machine. The table has a working surface of 24 x 48 in. and a travel of 48 in.

Improved Riveting Hammer

A riveting hammer that, it is stated, will not short-stroke, is being manufactured by George Oldham & Son Co., Frankford, Philadelphia. The piston travels the full length of the cylinder on the upstroke in order to change the valve, which is moved rearwardly by the momentum of the piston.

A locking ring with spring tension engages in a ratchet on the handle and exerts a constant thrust which keeps the handle tight and securely seated on the valve box, thus to eliminate any leak. The parts are emphasized as being easily accessible. The hammer is made in three sizes as follows: Stroke 6 in., length 18¼ in., weight 19¾ lb.; stroke 8 in., length 20¼ in., weight 21¾ lb.; stroke 9 in., length 21¼ in., weight 22¼ lb. It is pointed out that the light weight and short over-all dimension makes the hammer desirable for work in close quarters.

The Prevention of Pipe Corrosion

The Anti-Corrosion Engineering Co., 32 East Forty-eighth Street, New York, has been organized to put into commercial use the Speller and other methods for the prevention of internal corrosion and rusting of iron and steel hot-water pipes and other equipments used in domestic and industrial water supplies and power plants by the removal of the oxygen in solution. Several effective means have been devised for the removal of the dissolved oxygen from water, and it is these methods that the company has put into use.

The president and general manager of the new company is Dr. Charles V. Paterno, a builder for many years of fine apartment houses in New York. Homer Addams, vice-president Kewanee Boiler Co. and the treasurer of the American Society of Heating and Ventilating Engineers, is a vice-president of the company. F. N. Speller, metallurgical engineer, the inventor of the process for the prevention of internal corrosion, is the consulting metallurgical engineer of the company. Dr. William H. Walker, the dean of the division of industrial co-operation and research of the Massachusetts Institute of Technology, is the consulting chemist, and J. R. Musselman, consulting equipment engineer of New York, is the consulting mechanical engineer. Perry West, president of the New York Chapter of the Society of Heating and Ventilating Engineers, is the executive engineer of the company.

The Richardson Co., Toledo, Ohio, in which a number of financial and business men are interested, has been organized with a capital stock of $1,000,000 to provide capital for the expansion of local industries and to render assistance to new concerns that wish to locate in that city. S. O. Richardson, Jr., is president; Henry L. Thompson, W. L. Wilner, James Bentley, vice-presidents, and A. B. Richardson, secretary.

DECREASED EARNINGS

Republic Iron & Steel Co. Makes Poor Showing in 1919 Compared With 1918

Outstanding features of the 1919 report of the Republic Iron & Steel Co., Youngstown, Ohio, are: The 30 per cent decrease in production in all iron and steel commodities from 1918; the net reduction to the surplus account for the year of $1,241,490; the decrease in net profits from $7,791,933 in 1918 to $2,141,196 in 1919; the decrease in gross volume of business to $45,872,344 in 1919 from $75,224,110 of the year before; the decrease in pig iron production from 1,030,411 gross tons in 1918 to 791,597 tons in 1919, a fall of more than 20 per cent; a decrease in ingot production from 1,119,702 gross tons in 1918 to 752,417 tons the following year; a dropping off of finished and semi-finished products from 1,024,040 net tons in 1918 to 702,040 tons last year; a decrease in ore production from 1,512,071 gross tons in 1918 to 1,272,707 tons in 1919; a drop in coke output from 1,207,896 tons in 1918 to 959,602 tons the following year; a decrease in average number of men employed from 14,668 in 1918 to 11,784 the following year, with the increase in average wages per man from $1,619 in 1918 to $1,822 in 1919 and the decrease in total payroll from $23,747,260 in 1918 to $21,466,605; an increase in amount of unfilled orders on hand at the end of the year, both in finished and semi-finished materials, and pig iron, the comparative figures being 143,383 tons to 389,524 tons, and 63,132 tons to 96,855 tons, 1918 and 1919 respectively. According to the twentieth annual report of Chairman Topping:

Income Report

"The problems of readjustment from war to peace, referred to in our last annual report, were continuing factors of influence on general business throughout the year 1919. The first effect of the armistice was business uncertainty and reaction, resulting in a period of liquidation and declining prices. This situation continued throughout the first four months of the year 1919, followed by gradual improvement in demand for iron and steel, in both foreign and domestic markets, under which influence prices strengthened, but at no period of the year did the price level exceed that recommended by the Industrial Board of the Department of Commerce in effect March 21, 1919, while the average value of all iron and steel products shipped during the year 1919 was about 12 per cent less per ton than the average shipping values of the preceding year. Cost of production, however, throughout the year was on a gradually increasing scale—operations being adversely affected by labor inefficiency, lack of transportation and by a series of strikes, affecting both the mills and mines. As a result of these conditions a sub-normal output for the year ending Dec. 31, 1919, followed, the decline in production being emphasized during the strike period of the fourth quarter of the year, while the average production for the year for all iron and steel products was about 30 per cent less than the preceding year. In consequence of adverse operating conditions, together with strike losses, earnings were reduced, net profits applicable to dividends for the year ending Dec. 31, 1919, after making full deductions for repairs, maintenance, depreciation, extinguishment, taxes and other contingencies, being $2,141,195.69.

"Although the net earnings for the year were not sufficient to satisfy the dividend requirements of both the preferred and common stock outstanding, the board of directors were of the opinion that accumulated profits warranted a continuation of dividends at rates authorized, particularly as an early return to normal operations and profits was prospective and has since been realized.

"On account of large cash expenditures made during recent years for property additions and extensions, also because of the company's expanding business needs, the board of directors decided to strengthen the working capital by the proceeds of sale, at par, to the holders of the common stock, of 26,480 shares of the unissued authorized common stock and 1610 shares of treasury common stock. Upon the completion of this transaction the total outstanding common capital stock will be $30,000,000, and the working capital will be increased by the sum of $2,809,000.

"Pursuant to our general policy of extending and diversifying production, the company acquired during the latter part of May, 1919, by cash purchase, the land and property of the DeForest Sheet & Tinplate Co. at Niles, Ohio, the capacity of which property is now being doubled, which, with other general improvements authorized, will aggregate an expenditure of approximately $4,000,000. Upon completion of this program our earning power should be materially increased.

"As a general result, the net reduction to the surplus account for the year was $1,241,490.31 and the net balance of surplus as of Dec. 31, 1919, was $33,880,971.91, while the net balance of working assets as of Dec. 31, 1919, was $23,610,604.56.

Blast Furnaces

"Owing to the improvements and additions heretofore made to our Northern pig iron producing capacity, your company is now fully self-contained with respect to its steel-making pig iron requirements, and at times will have some surplus capacity to divert to the merchant pig iron trade.

"The total production was more than 20 per cent below that of the preceding year. The reasons for this reduction in tonnage were lack of demand for steel and iron products during the first half of the year and the steel workers' and the coal miners' strikes which occurred during the last quarter of the year, so that the third quarter was the only one during which normal tonnage was attained. The theoretical blast furnace capacity of the company is as follows: Northern district, 1,100,000 tons; Southern district, 325,000 tons; total, 1,425,000 tons.

Bessemer and Open-Hearth Works

"The only important improvement made at the Bessemer plant during the year 1919 was the installation of a complete drinking water purification and cooling plant with distributing lines to various points where it is used by our employees. The former general efficiency of this plant was maintained by liberal expenditures for repairs and upkeep, and all new construction work mentioned in the 1918 report was completed.

"At the open-hearth works there was installed in 1919 an additional electric crane in the 40-in. blooming mill, a 1500-hp. feed water heater in the blooming mill engine house and various additional tools and equipment in the machine shop. A complete roll-turning shop with complete equipment of roll lathes and tools, including cranes, was also put in together with extensions to the mill office building. All construction work mentioned in the last annual report was completed, and a complete drinking water purification plant and cooling station with distributing lines was installed for the purpose of furnishing our employees with pure cool water for drinking purposes. The production for the year shows a material decrease due to lack of demand during the greater part of the first half of the year and the various strikes which occurred during the last quarter.

Labor and Employment

"The uncertain and disturbed condition of business during the first four months of 1919 seriously affected employment during that period, labor being reduced to a half-time basis, while radical reductions also occurred in the selling prices of iron and steel and profits, yet inasmuch as the cost of living was unchanged, wage rates were maintained in the hope of future business improvement. This expectation was realized during May and June, 1919, by increased business activity, followed by increased employment; in fact, operations became normal during the third quarter of this year, as a result of which unemployment disappeared and a labor shortage developed. This situation was taken advantage of by agitators and radical labor leaders to

emphasize the spirit of general unrest and discontent. This agitation culminated in an effort by the American Federation of Labor to unionize the steel workers. As a result, a general strike was declared on Sept. 22, 1919, followed by a complete shut-down of all of our plants in the Youngstown, Ohio, district, although many of our employees were reluctant to quit work; in fact, our men never made any direct demands upon us, although indirect demands were made for them, through the press, by the labor organization claiming recognition. After several weeks of idleness the management of the company decided to resume operations and notified its employees that work would be resumed under open shop conditions; that the policy and practice of the company would be to meet its employees, either individually or by committees, to discuss any matters affecting working conditions, wages, etc., in accordance with our previous practice.

"Operations were resumed in part on Oct. 11, 1919, under strike conditions, subject to continued picketing and threats of violence against all employees reporting for work, but notwithstanding these difficulties, gradual resumption of work followed, with normal operations in sight during November, when operations were again badly crippled by the coal strike, which closed down about 50 per cent of our coal mines, while the balance of our coal production was partly commandeered by the Government for public use, and as a result of these conditions our fourth quarter's employment on the average was reduced to one-third time.

"On account of restricted operations, due to lack of demand during the first four months of the year and to shut-downs caused by the strike beginning Sept. 22, 1919, labor statistics are not fairly comparable with preceding years. It is interesting, however, to note that the present wage rates, as compared with pre-war rates, are up about 135 per cent, whereas the cost of living is estimated not to exceed 82 per cent above pre-war costs, but at operating points, where the company exercises control over rents and stores, the increase in living costs was substantially below 82 per cent.

Unfilled Orders

"The balance of unfilled orders on hand Dec. 31, 1919, shows a substantial increase as against the previous year, while the current demand for iron and steel is in excess of supply at rising prices. Another factor of a stimulating character is that of rising costs, which, unless placed under control, will inevitably result in further advances. The conditions noted have suggested a conservative policy of sales, otherwise our unfilled order balances would have been considerably in excess of those reported herein.

"It is gratifying to state that arrangements entered into for the extension of our export trade, referred to in our last annual report, met with satisfactory results and promise continued growth. Our export business, however, suffered similarly to domestic business, on account of the general embarrassment to both production and shipments. The outlook for future business, both domestic and foreign, is encouraging, and full operations for an indefinite period are promised."

Comparative Statement of Income, Republic Iron & Steel Co.

	Year Ending Dec. 31, 1919	Year Ending Dec. 31, 1918	Year Ending Dec. 31, 1917
Net earnings from operations, after deducting charges for maintenance and repairs of plants amounting to: Dec. 31, 1919, $4,707,709.50; Dec. 31, 1918, 5,147,442.76; Dec. 31, 1917, 3,559,157.62	$4,456,341.45	$18,177,046.85	$28,329,718.46
Interest and dividends received	575,496.24	729,767.82	439,302.93
Total profits for the year	$5,031,837.69	$18,906,814.67	$28,769,021.39
Less:			
Depreciation and renewal of plants	$1,381,220.21	$4,183,319.07	$1,999,760.26
Exhaustion of minerals	460,905.30	512,619.78	274,072.31
Excess profits tax, etc	315,112.46	5,680,759.44	9,878,657.30
	$2,157,237.97	$10,376,698.29	$12,152,489.87
Net profits for the year	$2,874,599.72	$8,530,116.38	$16,616,531.52
Deduct:			
Interest on bonds and notes	733,403.03	738,182.44	759,334.67
Net profits applicable to dividends	$2,141,196.69	$7,791,933.94	$15,857,196.85
Add:			
Surplus Dec. 31, 1918	$35,122,462.22		
Surplus Dec. 31, 1917		$30,711,988.28	
Surplus Dec. 31, 1916			$18,236,251.43
	$37,263,658.91	$38,503,922.22	$34,093,448.28
Deduct:			
Dividends on preferred stock	$1,750,000.00		
Dividends on common stock	1,632,687.00		
Dividends on preferred stock		$1,750,000.00	
Dividends on common stock		1,631,460.00	
Dividends on preferred stock			$1,750,000.00
Dividends on common stock			1,631,460.00
	$3,382,687.00	$3,381,460.00	$3 381,460.00
Net surplus carried to balance sheet	$33,880,971.91	$35,122,462.22	$30,711,988.28

Wellman-Seaver-Morgan Report

At the annual meeting of the stockholders of the Wellman-Seaver-Morgan Co., held at the company's office Feb. 17, a report of the year's work was given by the president, E. S. Church, in part as follows:

"The year 1919, in so far as the metal industries were concerned, may be best described as one of great expectations but deferred realization. Starting with the cessation of hostilities, manufacturers whose hopes had been raised to a high pitch by the anticipated demands for the rehabilitation of the devastated areas, early found themselves disillusioned; all emergency Government work was rapidly discontinued, readjustments of business to peace conditions interfered with efficient operation of plants, and strikes, local and national, served only to increase the difficulties under which executives and employees were laboring to carry on work to a successful issue.

"Our company may look back with great satisfaction on the results obtained from the contracts undertaken with the national Government. Within a very short time, we shall have completed over $3,350,000 of equipment for the torpedo boats. The entire work has been carried on without any friction between ourselves and the Navy Department, and all adjustments made with them have been very fair. There has been no criticism of our workmanship and deliveries, and we have been highly complimented on our methods of handling the work, by the presidents of the shipbuilding companies to whom the equipment was shipped.

"While there was a lull during the year in the requirements of the iron and steel works, other industries showed remarkable activity, and particularly so the tire trade. At our Akron shops we have taken on a complete line of rubber machinery, and, owing to the unprecedented demand this branch of the business has developed to such large proportions that these shops have been kept running to full capacity for practically the entire year. The orders which we now have on our books will keep us running from six to seven months

at the same rate, and to make deliveries some of this work has been transferred to the Cleveland shops of the company.

"It will be interesting for the stockholders to know that your company has developed a four-cylinder gasoline engine, 4¾ in. x 6 in., suitable for heavy trucks, tractors and standard cruising launches.

"Orders which we have lately received for large engineering installations give promise of renewed activities in these lines, and we may look forward to having both shops running to full capacity during the coming year. A comparison of the unfilled orders on hand on Jan. 31 of this year, amounting to $4,875,000, and those on hand at the same time last year, amounting to $3,915,000, is encouraging evidence of what may be expected.

"The increase in the business of the company, shown in condensed form, will be of interest to the stockholders:

	Gross Business	*Net Profit After Federal Taxes*
For 12 years preceding 1917—average	$2,120,083.32	$73,888.62
1917	4,687,928.00	466,604.31
1918	7,559,488.47	343,082.63
1919	7,478,118.91	534,942.28

"Financially, we have reduced our borrowed capital from $1,200,000 to $425,000; we have regularly paid our quarterly dividends, besides the deferred dividends on the preferred stock for the years 1917 and 1918. The original issue of preferred stock has been redeemed and cancelled and there is but one class of preferred stock outstanding. Our working capital is ample for anticipated requirements."

Condensed Balance Sheet as of Dec. 31, 1919

ASSETS.

Current:	
Cash	$305,978.14
U. S. Liberty bonds	188,541.70
Notes receivable	1,187,807.24
Accounts receivable	942,021.92
Inventory	529,953.40
Uncompleted contracts	1,529,327.24
Other assets	74,746.20
Permanent land, buildings and machinery	3,143,317.23
Patents	264,512.79
Deferred	31,708.85
	$8,197,914.71

LIABILITIES.

Current:	
Notes payable	$425,000.00
Accounts payable	712,955.44
Dividends payable Jan. 2, 1920	81,350.00
Accrued	37,718.50
Advances on contracts	453,554.62
Reserves	274,722.29
Capital stock, preferred	2,500,000.00
Capital stock, common	2,540,000.00
Surplus	1,172,113.86
	$8,197,914.71

Report of By-Products Coke Corporation

The By-Products Coke Corporation, South Chicago, Ill., had an unsatisfactory year in 1919, according to the annual report just made public. Gross earnings were $1,050,694, compared with $4,230,204 in 1918. Net earnings available for dividends were $105,345, equal to 1.22 per cent on the capital stock. The company paid $388,452 in dividends during the year and set aside $129,400 for payment in dividends on Feb. 20, 1920. The year's deficit, after dividends, was charged against the previous surplus, which on Dec. 31, 1919, after allowance for the February dividend, totaled $2,599,221, compared with $3,011,818, at the beginning of 1919. The report explains that the company suffered heavy losses incident to the coal and steel strikes. It also mentions the sale of its coke plant at Indiana Harbor to the Steel & Tube Co. of America for $3,407,600, paid in the latter company's bonds and $2,044,500 of its common stock.

Sullivan Machinery Co. earned $25.50 a share on the $4,887,550 capital stock in 1919, compared with $23.44 on the $3,846,800 stock in 1918. Net earnings last year were $2,160,887, compared with $2,140,035 of the year before. After dividends there was a surplus in 1919 of $752,074, compared with $440,074 the year before.

Wheeling Steel & Iron Co. Annual Report

The twenty-eighth annual meeting of stockholders of the Wheeling Steel & Iron Co., Wheeling, W. Va., was held last week. The income account and statement of surplus of the company for the year ended with Dec. 31, 1919, shows:

Net earnings		$1,925,331.53
Dividends and interest received		219,869.60
Total income for the year		$2,145,201.13
Less:		
Provision for depreciation, taxes, etc.	$721,138.73	
Net profit for the year		$1,424,062.40
Deduct:		
Interest on bonds and mortgages	$145,249.84	
Interest on notes payable	611.12	
		145,860.96
		$1,278,201.44
Deduct dividends:		
7 per cent paid in cash	$650,439.00	
2 per cent payable Jan. 2, 1920	185,842.00	
		836,281.00
		$441,920.44
Add:		
Surplus at Dec. 31, 1918	$9,099,424.98	
Less:		
Amount paid as Federal income and profits taxes for year ending Dec. 31, 1918	3,695,271.00	
		5,404,153.98
Net surplus carried to balance sheet		$5,846,074.42

Production

The production for the year, as compared with the three previous years, was as follows:

	1919	1918	1917	1916
		Gross Tons		
Pig iron	134,378	203,456	209,206	210,183
Ingots	129,228	184,460	224,296	231,784
Billets and slabs	116,210	164,754	207,347	209,551
Finished product	122,071	174,267	195,755	184,500
		Net Tons		
Coal mined	172,819	252,432	266,308	210,027

Shipments

The value of shipments for the year was	$16,436,273.09
Value of shipments for 1918	27,475,915.31
Value of shipments for 1917	27,964,341.58
Value of shipments for 1916	15,073,530.78

Pay Roll

The amount of the pay roll for the year was	$4,439,748.25
Pay roll for 1918	6,452,375.45
Pay roll for 1917	5,146,747.45
Pay roll for 1916	3,267,096.88

President Isaac M. Scott, in his statement to the stockholders, said in part:

"It might be cited here that the demands made on your company by its workmen, prior to striking, were of such an indefinite character as precluded an intelligent consideration of them. Wages were to no considerable extent involved, it being rather a determined effort on the part of the officials of certain labor organizations to unionize the entire steel industry of the country.

"Feeling that the interest of your company could best be served by allowing the mills to remain idle until such time as the employees were willing to return to work under the conditions that prevailed prior to the strike, no attempt was made to operate with outside workmen. On or about Dec. 10 a considerable number of our employees having evidenced a desire to return to work under the old conditions, the plants were again thrown open and operations resumed. Aside from the loss of profits that would otherwise have been earned during the time of suspension, the company suffered no material hardship from the strike, as the direct strike expense was unimportant.

"While the business outlook for the future is somewhat confusing, it is on the whole encouraging. At the present time there is an active demand for all classes of steel products, which, with no serious financial unsettlement or general labor disturbance, should continue indefinitely and at prices showing a fair return on the capital invested."

Death of James Gayley

James Gayley, metallurgist, inventor, author and first vice-president of the United States Steel Corporation from 1901 to 1908, died at his home in New York on Feb. 25, after an illness of three weeks, beginning with an attack of heart trouble. On Feb. 27 funeral services were held at the Brick Presbyterian Church in New York, attended by many leaders in the iron and steel trades, and the interment was at Colora, Md., on Saturday, Feb. 28.

Since the later eighteen-eighties, when the fame of his work at the Edgar Thomson group of furnaces in securing large pig-iron output with low fuel consumption went into all iron-making districts in this country and Great Britain, James Gayley has had a place of high prominence for his mastery of problems arising out of the handling and treating of iron ore and the operation of the blast furnace for the economical production of pig iron. While others concentrated on details of steel-making processes and rolling-mill operation, Mr. Gayley's career was signalized by an enthusiastic study of all that pertains to the raw materials of the industry.

JAMES GAYLEY

In the rôle of inventor, he is best known in connection with the dry-air blast, this process providing for the drying of air by refrigeration before it is drawn into the blast-furnace blowing engine. Other of his valuable inventions were bronze cooling plates for blast furnace walls, and the auxiliary stand for holding the ladle while the Bessemer heat is being poured, supplementing the crane and enabling two vessels to do the work for which four were formerly required. While at the Edgar Thomson works of the Carnegie Steel Co. he was the first to provide charging bins for the raw materials at the blast furnace; he also installed the first compound condensing engine for supplying air blast to a blast furnace. When the ore docks of the Carnegie Steel Co. were built at Conneaut, Ohio, on Lake Erie, he ordered a revolutionary apparatus for the unloading of ore from vessels and contributed in a practical way to the designing of a vessel construction adapted to the use of this (the Hulett) type of unloader. Mr. Gayley had great faith in the possibilities of mechanical handling of ores. At a dinner given in Cleveland in November, 1904, to visiting members of the Iron and Steel Institute (British) he spoke of the unparalleled rate of 8-10 mill per ton mile as having been reached in the lake transportation of iron ores and their delivery at lower lake ports. Forty years previously, he said, ore boats were unloaded by hoisting the ore to the deck with horse-power and transferring it to wheelbarrows from which lines of men dumped it upon the ore piles or in cars. In that year (1904) the steamer Wolvin, carrying 10,300 tons of ore, was loaded in two hours at an upper lake port and the cargo unloaded at Lake Erie docks in four and one-half hours. Mr. Gayley surprised his hearers by predicting a total shipment of 45,000,000 tons of Lake Superior ore in a single season in the next ten years, or by 1914; but the prediction was quite within bounds as in 1912 the shipments exceeded 48,000,000 tons. In 1916, or 12 years after Mr. Gayley spoke, they were above 66,000,000 tons.

James Gayley was born at Lock Haven, Pa., Oct. 11, 1855, son of Samuel A. and Agnes Malcolm Gayley. His boyhood was spent at West Nottingham, Md. His father was a native of the north of Ireland and coming to this country at early manhood became a Presbyterian minister in Pennsylvania. The son had his early training at the West Nottingham Academy, from which he went to Lafayette College, taking a course there in mining engineering and graduating in 1876. His first work was as chemist of the Crane Iron Co. at Catasauqua, Pa. In 1879 he went to the Missouri Furnace Co., St. Louis, as superintendent. That position he resigned to become manager of the blast furnaces of the E. & G. Brooke Iron Co. at Birdsboro, Pa. In 1885 he was put in charge of the furnaces of the Edgar Thomson Steel Works at Braddock, Pa., then owned by the Carnegie Brothers Co., Ltd., which became the Carnegie Steel Co. His record with the Edgar Thomson furnaces was remarkable for fuel economy, large output in proportion to cubic capacity of stack and to durability of linings. With fuel so accessible, blast furnace practice in the Pittsburgh district had been wasteful and a heavy blast was the rule. Mr. Gayley achieved what were then considered phenomenal results with a moderate blast and relatively low fuel consumption. There was sharp rivalry in outputs and in fuel consumption between the different sections of the country, particularly between the Chicago district and the Pittsburgh district. With the long haul of West Virginia and other cokes to South Chicago, blast-furnace management there was naturally highly concerned with reduction of fuel consumption per ton of iron. In the rivalry for blast-furnace records, as low as 1700 lb. of coke was reached per ton of pig iron, but there was some reaction a little later from this competition for low fuel records, since they were often secured at the expense of quality and of regular working and sometimes resulted in expensive furnace troubles.

In the early eighteen-nineties Mr. Gayley was promoted to be manager of the entire Edgar Thomson plant and in 1897 he became a managing director of the Carnegie Steel Co. When the great merger which created the United States Steel Corporation came about in 1901, he was made first vice-president and entered upon an important part of his life work in having charge of the department of raw materials and their transportation. He resigned from the Steel Corporation in November, 1908, and soon after became president of the American Ore Reclamation Co., which has installed many plants for the sintering of fine iron ores and flue dust. For several years he was president of the Sheffield Iron Corporation, which operates a blast furnace at Sheffield, Ala.

He was a member of the American Institute of Mining Engineers, of which he was president in 1904-1906, also a member of the Iron and Steel Institute (British), the American Iron and Steel Institute, the Lawyers', Engineers', Metropolitan and University clubs in New York. Mr. Gayley's contributions to technical literature during the past 35 years have been numerous and important and are found chiefly in the transactions of the American Institute of Mining Engineers, the Iron and Steel Institute and other American and foreign societies of which he was a prominent and honored member. Among his contributions to transactions of the American Institute of

Mining Engineers are the following: "A Chilled Blast Furnace Hearth," "Development of American Blast Furnace, with Special Reference to Large Yields"; "The Preservation of the Hearth and Bosh Walls of the Blast Furnace," and "Application of Dry-Air Blast to the Manufacture of Iron." In 1912 the University of Pennsylvania and Lehigh University conferred upon him the honorary degree of doctor of science. He was awarded the Elliott Cresson Medal by the Franklin Institute of Philadelphia in 1908 and the Perkin Medal in 1913. Mr. Gayley presented to Lafayette College Gayley Hall, for the study of chemistry and metallurgy, in 1902.

Mr. Gayley's formal announcement of the dry-air blast was made in a paper he presented at the second American meeting of the Iron and Steel Institute, held in New York in October, 1904, and which was attended by about 150 European members, chiefly from Great Britain. The paper was entitled, "The Application of Dry-Air Blast to the Manufacture of Iron," and detailed the results of experiments carried on in the previous year at Isabella furnace, Pittsburgh, in the refrigeration of air both for the elimination of much of the moisture and for making the moisture content of the air blast uniform, with resulting saving of 20 per cent in fuel consumption and increase of 25 per cent in output. Dr. R. W. Raymond, secretary of the American Institute of Mining Engineers, said in the discussion of the paper, "I am not afraid to say that Mr. Gayley has contributed to your proceedings this day one of the few great classics of our art." Mr. Gayley's comparison of operations at Isabella furnaces, as given in his paper, showed an average daily output of 358 tons and an average coke consumption of 2147 lb. without dry blast and an average daily output of 447 tons and an average coke consumption of 1726 lb. with dry blast.

In the next few years a considerable number of dry-blast installations were made in the United States, several in Great Britain, notably at Guest, Keen & Co.'s furnaces in Cardiff, and one in Germany—at the Thyssen furnaces. The United States Steel Corporation equipped two furnaces at South Chicago for dry-air blast. Other early installations were at the Warwick and Brooke furnaces in eastern Pennsylvania, at Brier Hill in the Mahoning Valley and at Toledo furnaces, Toledo, Ohio. Good results were reported from all these installations. German engineers were critical and from that country came some elaborate calculations going to show that the saving in fuel and the increase in output due to dry blast were much less than had been claimed. The answer of American engineers was that facts were conclusive as against theory and that German engineers, unable to understand the reason for the great saving due to dry air, had adopted the expedient of denying the saving.

From the standpoint of nearly 15 years after the installation of various dry-blast plants in this country, it can be seen that the evolution in blast-furnace practice has been in large part the result of the stimulus given by the dry blast agitation. If the leading steel interests did not extensively invest in refrigerating plants, they steadily worked to secure the same results without making the considerable investment required for drying the air. Inequalities in humidity have been met by variations in the volume of air blown, secured by increasing or decreasing engine revolutions. In recent years also there has been a resort to higher heats (1200 to 1300 deg., as against 1000 deg. aimed at in Mr. Gayley's practice), also a concentration of heat on the tuyere area. The straightening of lines has come, too, and to-day the diameter of the hearth is close to that of the bosh. Further, low fuel cost has been secured through extensive by-product coke oven installations, that being perhaps the most important development in connection with blast furnace raw materials in the past 15 years. All these developments may fairly be said to accent the epochal character of Mr. Gayley's work for the saving of fuel and the increase of output.

The Powell Pressed Steel Co. has been formed at Hubbard, Ohio, with a capital of $225,000 by W. J. Powell, E. J. Powell, Ward Beecher, H. S. Wyald and A. M. Henderson.

Canada Foundries & Forgings Co. Meeting

The following directors were unanimously elected at the meeting of the Canada Foundries & Forgings Co., Brockville, Ont., at a meeting held there Feb. 24: T. J. Dillon, Welland, Ont.; J. H. A. Briggs, Brockville, Ont.; J. T. Dillon, Buffalo; J. A. Mackay, Charles W. Macleam, W. M. Weir, Colin O. Cameron, Stephen J. L. E. Huray, Montreal, Que.; Lieut.-Col. Monsarrat, Ottawa, Ont.; Lawrence Chamberlain, New York; Henry Bertram, Dundas, Ont. When the directors met the following officers were elected: T. J. Dillon, president and general manager; George P. Graham, vice-president; J. H. A. Briggs, secretary-treasurer; F. C. Hesch, assistant secretary-treasurer; executive, the president, vice-president, W. M. Weir, J. T. Dillon. The report showed net operating profits for the year after providing for all repairs, bad and doubtful debts and depreciation of $149,623, and a net surplus of $169,915. The balance of the surplus brought forward from the year 1918 is $1,467,622, out of which dividends for the year at the rate of 7 per cent on preferred and 12 per cent on common shares, a total of $182,000, have been paid.

World's Output of Chrome Ore in 1918

In view of the record-breaking production of chromite in the United States in 1918, reported by the U. S. Geological Survey, it is of interest to note the part it played in the world's output for that year. The approximate output in round numbers for each country is expressed as follows in metric tons:

United States	84,000
Canada	20,000
Cuba	2,000
Guatemala	1,200
Brazil	18,000
British South Africa	28,000
Turkey (Asia Minor)	14,000
Greece	10,000
Austria-Hungary	500
Russia	16,000
India	20,000
Australia	800
New Caledonia	26,000
Japan	8,000

Puddling Rate Advanced

YOUNGSTOWN, Ohio, March 1.—The puddling rate for March and April moves up 76 cents a ton as a result of the bi-monthly examination conducted by the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers. Average sales price of iron bars shipped by 25 mills from Dec. 20 to Feb. 20 was on a 2.70c. card, giving boilers $13.38 per ton of 2240 lb. The card rate at the settlement Jan. 1 was 2.55c., creating a boiling rate of $12.62 per ton for the three previous bi-monthly periods. The rate of $13.38 was based on a 2.50c. card. Finishers, such as rollers, heaters, roughers, catchers and stranders, were advanced 7½ per cent from 74½ per cent above the base to 82 per cent.

Formed Alliance with Hadfields

The American Clay & Machinery Co., Bucyrus and Willoughby, Ohio, has formed an alliance with Hadfields, Ltd., Sheffield, England, under the terms of which the English steel maker is to take large financial interest in the Ohio company, which will engage in the manufacture of steel under the Hadfield processes and will change its name to the Hadfield-Penfield Steel Co. R. C. Penfield, president and, C. M. Weston, vice-president of the Clay Machinery Co., recently returned from England, where they closed the deal with Sir Robert A. Hadfield.

J. W. Frazier, J. W. Ellms and R. E. Sheal announce the incorporation of the Frazier-Ellms-Sheal Co., Cleveland, for the purpose of conducting a general engineering business in the design and construction of water works, pumping and power plants, water purification and sewage disposal plants, sewer and drainage systems, and buildings.

PERSONAL

E. M. Sprague and E. A. Benson have resigned as contracting engineer and assistant contracting engineer, respectively, of the American Bridge Co. in charge of its Cleveland office, and have become associated with the McClintic-Marshall Co., Pittsburgh, in similar capacities, and opened a temporary office for the latter company March 1 at 209 Statler Hotel. The company will establish a permanent office in the Hanna Building, Cleveland, as soon as that building is completed. Heretofore the interests of the McClintic-Marshall Co. in the Cleveland territory consisting of northern Ohio, have been handled from its main office. Frank A. Rideout, who has been in charge of the American Bridge Co.'s Buffalo office as contracting engineer, will succeed Mr. Sprague in Cleveland. Mr. Sprague has been with the American Bridge Co. since its organization 20 years ago. Before his connection with the company, he was associated with the Jilett Herzag Co. in Denver, two years, which company was taken over by the Bridge company when the latter was organized. About five years later he was placed in charge of the company's Cleveland office. Mr. Benson has been with the American Bridge Co. about 15 years, coming to Cleveland five years ago from Boston, where he was connected with the company about 10 years.

W. J. Reed, secretary and general purchasing agent Wisconsin Bridge & Iron Co., North Milwaukee, Wis., has severed his long connection with the bridge works, and has become associated with Geo. W. Smith and George Gibbs in their sales organization, handling iron and steel commodities. Their office is in the First Wisconsin Building, Milwaukee, Wis.

Thomas H. Kane, vice-president and works manager Truscon Steel Co., Youngstown, Ohio, has been elected a member of the board of directors, succeeding Joseph Boyer, Detroit, Mich., who declined re-election because of age. Other directors and officers were re-elected at the annual meeting in Detroit.

Donald Payne has resigned as assistant production manager of the Aluminum Manufacturers, Inc., Cleveland, to become advertising manager of the Osborn Mfg. Co., Cleveland.

George P. Bard was re-elected president and other officers were re-elected by directors following the recent yearly meeting of the Petroleum Iron Works Co., Sharon, Pa. President Bard states the company's capacity is fully occupied.

Marcus Grossman, graduate of Massachusetts Institute of Technology, has been appointed chief metallurgist of the Electric Alloy Steel Co., Youngstown, Ohio. He is now with the Westinghouse Electric Co. at Pittsburgh.

At the reorganization of the American Cutlery Co., Chicago, on Jan. 7, M. Hirsch, vice-president, was elected president and treasurer. He has been actively engaged in the management of the organization for 33 years. Henry Hirsch, identified with the sales branch for 30 years, was elected vice-president. Lawrence H. Powell, engaged in the sales and factory management of the company for 18 years, was elected secretary. The company claims to be the second largest cutlery manufacturing company in the United States. It was organized Nov. 27, 1867, reorganized Jan. 6, 1872, and again reorganized Sept. 5, 1877.

Joseph P. Nelson has resigned as turn foreman at the steel plant of the Trumbull Steel Co., Warren, Ohio, to become superintendent of rolling mills of the Weirton Iron & Steel Co., Weirton, W. Va., under Charles Elliott, general manager. Associates presented Mr. Nelson an engraved gold watch and his wife a silver set.

E. L. Ford, director and member of the advisory committee of the Brier Hill Steel Co., Youngstown, Ohio, has gone to California for the rest of the winter and will also visit Florida before his return.

E. Kennedy, formerly in the Chicago office of Manning, Maxwell & Moore, Inc., has been appointed manager of the Buffalo office to succeed F. C. Meyer, who died recently.

At the annual meeting of the Elyria Iron & Steel Co., Cleveland, the following directors were elected: Hugh B. Wick, Myron A. Wick, George F. White, William T. Bentz, Walter Ferrier, F. R. Guyon, George C. W. Klippel. The directors subsequently organized as follows: President, Hugh B. Wick; vice-president, Myron A. Wick; secretary-treasurer, George F. White; assistant treasurer, George C. W. Klippel.

William F. Hough has been appointed employment manager by the Goodell-Pratt Co., Greenfield, Mass., anvils, chucks, to succeed the late Luther Weissbrod.

F. C. Sullivan, formerly vice-president Braddock Mfg. Co., Braddock, Pa., whose plant was sold recently to the Wilson-Snyder Mfg. Co., Pittsburgh, will devote his entire attention to the Columbiana Foundry Co., Columbiana, Ohio, of which he became president early in 1917, when he, with other associates, purchased this plant from the United Engineering & Foundry Co., Pittsburgh.

The Cleveland Steel Supply Co., of which C. E. Schnibbe is manager, has been appointed agent for the Cleveland district of the Erie Crucible Steel Co., high speed and carbon tool steels, Erie, Pa. Mr. Schnibbe was for 12 years with the Halcomb Steel Co., for five of which he was salesman with the Cleveland branch of that company. In March of last year he severed his connection with the Halcomb Steel Co. and organized the Cleveland Steel Supply Co.

Louis J. Campbell, president Electric Alloy Steel Co., has gone to Florida in the interest of his health.

At the annual meeting of the Michigan Smelting & Refining Co. in the company's administration offices at Detroit, John R. Searles was elected president and general manager to succeed the late Joseph Sillman, founder of the business. Other officers and directors were elected as follows: Norman Sillman, vice-president; Henry Levitt, secretary-treasurer; directors, John R. Searles, Emory W. Clark, Walter P. Crysler, Leo M. Butzel, Henry Levitt, Norman Sillman, Charles O. Patch.

Thomas W. Cummer, a director of Ramsay Brothers, Ltd., London, was recently in Baltimore, where, it is understood, he went to arrange for the purchase of machine tools and sheet metal to be shipped to England during June and July.

John Whitridge has been elected president of the Armstrong Stove & Mfg. Co., 207 South Charles Street, Baltimore.

L. D. Brueckel, New York district manager for the Weirton Steel Co., 30 Church Street for the past eight years, has become connected with Hitchcock, Lloyd & Co., 50 Broad Street, as an officer and director of the company. Mr. Brueckel was manager of the New York office for the Pope Tin Plate Co. before it was taken over by the Phillips Sheet & Tin Plate Co., which was later changed to the Weirton Steel Co. He will shortly sail for South America in the interests of his new connection. His place as district manager is being taken by W. P. Siebert, Jr., formerly assistant manager.

P. J. Dasey, sales manager Blodgett Engineering and Tool Co., Detroit, has resigned to join the staff of the Midwest Engine Co., Indianapolis, where he will be engaged in research and sales engineering work.

E. S. Morris, secretary and assistant treasurer Bayonne Bolt & Nut Co., Bayonne, N. J., with which he was connected for 12 years, resigned March 1 to become treasurer of the L. C. Harry Co., 114 Liberty Street, New York, heavy hardware, and also become connected with the Cortada & Morris Co., exporter, Havana, Cuba, with New York office at 114 Liberty Street.

Don F. Kennedy, Detroit manufacturer's agent, with offices in the David Whitney Building, has become local representative of the Union Electric Steel Co., Pittsburgh, manufacturer of high grade tool and alloy steels.

Henry J. Reeve, treasurer Stocker-Rumely-Wachs Co., 117 North Jefferson Street, Chicago, machinery and machine tool dealer, has disposed of his interests to his associates and retired from business on March 1.

At a meeting of the board of directors of the Employers' Association, Buffalo, Feb. 24, Lyman P. Hubbell of the Fillmore Avenue Foundry & Iron Works was elected president for the ensuing year, and Avery C. Wolf of the Jones Iron Works, vice-president.

Frank L. Driver, president Driver-Harris Co., Harrison, N. J., manufacturer of wire products, was the guest of honor at a dinner at Achtel-Stetters, Newark, N. J., Feb. 19, given by 67 officers and employees of the company. Mr. Driver will leave for Europe on March 6, for a two months' trip through England and France.

Among the appointments of the Chesapeake & Ohio Railway Co., through the office of the general manager at Richmond, Va., are those of E. W. Grice to manager purchases, stores and safety; R. M. Nelson, purchasing agent, both effective March 1.

Charles E. Dinkey, general superintendent Edgar Thomson Steel Works and blast furnaces of the Carnegie Steel Co. at Bessemer, Pa., has resigned, effective from April 1. Mr. Dinkey has been connected with the Edgar Thomson plants since 1880, starting as a messenger boy and receiving various promotions until he finally became general superintendent of the entire Edgar Thomson plant on June 1, 1903. Prior to receiving this appointment he was assistant general superintendent under Thomas Morrison and before that he was superintendent of the Edgar Thomson foundry. He intends to rest for about a year and as yet has made no definite business plans for the future. Mr. Dinkey is a brother of A. C. Dinkey, for many years president of the Carnegie Steel Co. and for several years president of the Midvale Steel & Ordnance Co., Midvale, Pa.

J. C. Henriques and M. A. Stone, Jr., have organized a staff of consulting engineers, and formed the Engineering and Appraisal Co., Inc., with offices at 103 Park Avenue, New York. Their field of work will cover the design and construction of mills, factories, power plants and chemical works, the design and development of special machinery and the formulation of commercial propositions on which the formation of new manufacturing corporations may be based. Members of the staff are specialists in the utilization of waste steam and the application of steam to chemical and other processes; the derivation of oxygen, nitrogen and other gases; the application of refrigeration and cold storage; the evaporation and concentration of solutions and liquids, and the design and development of special machinery.

Chickasaw City and Birmingham City, the two 9600-ton Alabama steel ships built at Mobile by the Chickasaw company, auxiliary of the United Steel Corporation, will sail in April and May respectively, the one for Rotterdam and the other for ports in Japan, probably Kobe and Yokohama, with half cargoes of Tennessee company steel products, the other half open to other freight. Subsequent sailings are also officially announced.

The McDougall-Duluth Shipbuilding Co., Duluth, Minn., will soon open a steel foundry at Polk Street and Fifty-third Avenue West. The plant contains about 26,000 sq. ft. of floor space and is equipped with an acid open-hearth furnace with a capacity of 20 tons a day. There is no other steel foundry within 150 miles of Duluth.

Active work was begun in December on the iron mines of Las Truchas property in the State of Michoacan, Mexico, according to a report from Consul Walsh. A big iron content is in sight, 10,000,000 tons of ore being calculated as the minimum deposit. The company expects to reach an output of 5000 tons a day.

OBITUARY

CHARLES A. WEEKS, inventor of the original Weeks rotating furnace for non-ferrous metals, died in Philadelphia on Saturday, Feb. 21. His death was both a complete surprise and shock to friends and associates alike. The greater part of Mr. Weeks' life was spent in developments in connection with the improvement of metals, especially those of the non-ferrous types. Previous to the invention of his electric rotating furnace, he built a number of rotating gas and oil furnaces from which he obtained his original basic ideas covering the subject. He was a true pioneer, having invested his own capital for the manufacture of a furnace of approximately two tons capacity which was installed and operated at the General Electric Co., Schenectady, nearly eight years ago. The reason that the furnace was not immediately placed on the market was that the non-ferrous field had developed only to a small extent; crucibles were cheap and a systematic investigation of losses in melting had not shown up the tremendous losses through volatilization.

A. WILZIN, who was for more than 20 years the director of the Paris Works of E. W. Bliss Co., and whose death was noted in THE IRON AGE of Feb. 26, first went to France in 1889, where he was in charge of the Bliss company's exhibit at the Universal Exhibition. He eventually stayed there as selling agent, and from a simple sales office developed by his energy and experience the present extensive French works of the Bliss company at Saint-Ouen, near Paris, where some 500 work people are at present employed. Mr. Wilzin was a versatile inventor, among his inventions being the automatic zig-zag top and bottom stamping presses, a hydromechanical press, and double end flanging machine for can bodies.

HARRY B. WHALL died at his home in Ashmont, Mass., Feb. 27, from double pneumonia. Mr. Whall was born in Dorchester, Boston, Sept. 5, 1868. For a number of years he was president of the Union Steel Casting Co., Boston, and for the past three years or so was the Boston representative of the New England Steel Casting Co., East Longmeadow, Mass. He had served in the Boston common council and later in the Massachusetts legislature.

DANIEL CHENOWETH, who died at his home in Indianapolis Feb. 18, at the age of 66 years, erected a nail factory in that city in 1883, said to have been the first west of Pittsburgh. Later he established similar factories at Jackson, Ohio, and Charleston, W. Va. He sold the plants and retired from business several years ago.

LEWIS MARCHALL MCCALLUM died suddenly in Chester, Conn., Feb. 23, aged 47 years, of influenza. Mr. McCallum for several years was secretary of the Parker Wire Goods Co., Worcester, Mass., and left that company to become associated with the M. S. Brooks Co., Chester, Conn.

CHARLES S. MARSH, Feeding Mills, Mass., died suddenly Feb. 24, in Indianapolis, aged 81 years. Mr. Marsh for the past five years has represented the Max F. Grinding Wheel Corporation, Chester, Mass., and had the reputation of being the oldest traveling salesman in the country.

FRANK K. MILLS, salesman for the Pittsburgh Steel Co., Pittsburgh, for many years and who called on the hardware jobbing and manufacturing trade in Central and Western New York, died very suddenly on Jan. 26, from an attack of heart trouble.

E. CLINTON SMITH, associated with the Jordan L. Mott Iron Works for 51 years, died unexpectedly Feb. 27, aged 67 years, at his home in Elizabeth, N. J. He rose from office assistant to sales manager.

F. C. MEYER, manager for the last six years of the Buffalo office of Manning, Maxwell & Moore, Inc., New York, died recently of pneumonia.

Standard Parts Co. Reorganized

The reorganization of the Standard Parts Co., Cleveland, was effected at a meeting Feb. 28. Plans for refinancing will be worked out at a future meeting. Several new names were added to the directorate including J. O. Eaton, president the Eaton Axle Co., and John Younger and C. I. Ochs, who have been associated with Mr. Eaton in that company, which is to be merged with the Standard Parts Co. Other directors include R. C. Hyatt, P. A. Connolly, T. E. Borton, Maynard Murch, F. R. White, H. P. MacIntosh, Jr., C. S. Eaton, W. H. Prescott, T. H. Jones, W. B. Bock, and E. J. Hess. J. O. Eaton was elected president, E. J. Hess, John Younger and Dan C. Swander, vice-presidents. T. E. Borton was re-elected treasurer and T. A. Connolly was re-elected secretary. R. C. Hyatt was elected assistant secretary.

The axle division of the company has been reorganized with the following officers: J. O. Eaton, general manager, succeeding D. K. Moore; C. I. Ochs, assistant general manager, succeeding L. P. Kalb; H. G. Weymouth, director of manufacturing; C. S. Dahlquist, director of engineering; George L. Bitting, director of sales, and P. T. Hill, assistant director of sales. The new organization of the American Axle Plant, Cleveland, includes J. M. Cook, factory manager, A. L. Watts, production manager, C. R. Griffiths, assistant production manager, W. J. Mitchell, office manager, and C. E. Miller, purchasing agent. D. E. Dugan has been made factory manager of the Cincinnati axle plant. Christian Girl, formerly president of the Standard Parts Co. with J. G. Utz, who has resigned as one of the vice-presidents, have opened an office at 301 Union Building, Cleveland. They expect to re-engage in the manufacture of automobile springs.

Another New Chapter of American Steel Treaters' Society

The Providence Chapter of the American Steel Treaters' Society was established on Feb. 27 at Providence, R. I. W. H. Eisenman, secretary of the national organization, addressed a largely attended meeting that evening held in the Narragansett parlors of the Narragansett Hotel. Many charter members were registered. F. N. Macleod, president Abrasive Machine Tool Co., was elected chairman; William H. Hunt, purchasing agent, Nicholson File Co., secretary; C. A. Rivard, superintendent die department, Gorham Mfg. Co., treasurer, and Louis D. Bartlett, plant engineer Nicholson File Co., vice-chairman. The executive committee is made up of Arthur H. Annan, superintendent Rhode Island Tool Co.; Herbert M. Heath, general manager National Collapsible Tube Co.; C. E. Hanson, proprietor C. E. Hanson Heat Treating Plant, and H. E. Wilkins, industrial gas engineer Pawtucket Gas Co.

New Card on Cement Coated Nails

PITTSBURGH, March 2.—A new card of extras on cement coated wire nails has been issued by the Pittsburgh Steel Co., Pittsburgh, and also by several other independent mills in which the same extras on cement coated nails apply as on bright nails except as follows: 20c. per keg additional over bright nails for those kinds and sizes of coated nails which formerly carried this differential of 20c. over bright nail extras in sizes 12 penny and larger. Extras for railroad and car nails include 15c. per keg additional on account of the unusually large kegs. This differential of 15c. formerly was added to the base price, but hereafter the base price will be the same for all kinds of coated nails on the new card in view of the 15c. differential being included in the list of extras; sizes of coated nails not listed in the bright nail catalog have been figured out proportionately. All coated nail extras are per count keg.

The corporate name of the Petterson Engineering & Mfg. Co., Worcester, Mass., has been changed to Bilt-Rite Mfg. Co.

The Pittsburgh District

Sales managers of the Pittsburgh-Des Moines Steel Co. met in its offices in Pittsburgh recently in annual convention to discuss business matters for the coming year. The company gave its salesmen a dinner at the Americus Club in that city on Wednesday evening, Feb. 18, at which George A. Smith, vice-president of the company, located at Des Moines, Iowa, and W. W. Hendrix, Pittsburgh, general sales manager, were speakers. On Thursday, Feb. 19, a trip of inspection was made to the large structural steel plant of the company at Neville Island, Pittsburgh. Sales managers of the company were present at the annual convention from San Francisco, Chicago, New York, Washington, Des Moines, Dallas and Chatham, Canada.

At the annual meeting of the stockholders of the Allegheny Foundry & Machine Co., held in its offices at Glassmere, Pa., officers were elected as follows: John C. Graham, president; Thomas N. Gummert, vice-president; E. H. Kennerdell, secretary and treasurer; Ira Fouse, general manager. The company during the reconstruction period after the war made some additions to its plant, and reports that last year was one of the most successful in its history. This company recently introduced a plan by which a payment of $500 will be made to the family of any employe who dies in service of the company, who has been in its employ six months, or more.

The Allegheny Steel Co., Brackenridge, Pa., manufacturer of plates, sheets and other steel products, has given its common labor an advance of 10 per cent and skilled labor an average advance of about four per cent.

The Cambria Steel Co., Johnstown, Pa., has announced an increase of 10 per cent in wages of common labor, the new rate being 44c. per hour, and wages of skilled labor will be adjusted to a higher basis.

The John Eichleay, Jr., Co., Pittsburgh, will erect a modern shipyard at Hays, Pa., near Pittsburgh, on part of the property of the Monongahela Iron and Steel Co. taken over by the Eichleay company when the first-named concern concentrated its plants at Paden City, W. Va. The Eichleay company recently contracted for a steamboat for the Mississippi River trade, and has also taken a contract for twenty timber barges.

J. W. Elton, formerly with James H. Matthews & Co., Pittsburgh, makers of steel stencils and steel stamps, has resigned to become general manager of the Pittsburgh Steel Stamp Co., Inc., recently organized at Pittsburgh, and whose new plant is on Penn Avenue, in that city.

On March 1 the Standard Steel Car Co., Pittsburgh, works at Butler, Pa., advanced wages of all employees receiving less than $3,600 per year, 10 per cent. Day laborers, formerly receiving 42½c. per hour, now receive 46c. per hour.

American Iron and Steel Institute

The spring meeting of the American Iron and Steel Institute will be held May 28 at the Hotel Commodore, New York.

The Armour Institute of Technology, 3300 Federal Street, Chicago, has purchased 80 acres, lying between Seventy-fifth Street on the north, Seventy-ninth Street on the South, Yates Avenue on the west and Colfax Avenue on the east, for $900,000. The institute will remove to this site, where buildngs will be erected which will cost $5,000,000, with equipment.

The General Electric Co., Lynn, is assembling raw materials to be used in the foundry of the Metals Production Equipment Co., Springfield, Mass., recently acquired. The plant is equipped for heavy work and probably will be in full operation by April.

The National Federal of Construction Industries will hold its first annual meeting at the Hotel Sherman, Chicago March 24-25. John C. Frazee, Drexel Building, Philadelphia, is executive secretary.

Trading Principally with Orient

Export in iron and steel continues to dwindle, with the Orient practically the only market at all active. As one exporter with European connections expressed the situation, "The European market is nearly dead, but it shows signs of reviving." Business has become so dull that several companies have turned to developing the import branch of their business until such time as exports show signs of revival. With exporters who deal with the Oriental markets, the chief difficulty is in filling orders. A large Japanese exporter recently placed orders for 1000 tons of bars, mostly 1-in. and 1½-in., about 200 tons of galvanized wire, 200 tons of wire rods and 200 tons of black sheets. Another recently shipped about 150 tons of galvanized wire and reports difficulty in obtaining small bars, under one inch, and fine gage sheets. The Japanese buyer usually insists upon fine gage, as he often resells the sheets by the piece for roofing purposes. Still another exporter to Japanese markets has sold about $75,000 in machine tools, including lathes, milling machines and boring mills. Lying ready for shipment at Rotterdam, an exporter in New York has about 300 tons of high silicon forging billets and another concern is offering a large amount of Belgian made billets. The purchasing agent for the Colonial Department, Government of the Netherlands has been in the market for about 200 tons of sheets and 200 tons of bars, but has been unable to place the order. An exporter, through his connections in England recently quoted $17.35 f.a.s. New York on 10,000 boxes of tin plate, but upon receiving acceptance found the mill was quoting $23.30. Among the concerns which are importing material is one with a large amount of high speed Swedish tool steel being delivered in lots of 50,000 lb., while another concern which buys heavily in the United States is considering the importation of block tin and low phosphorus pig iron.

The Smith-Eisemann Corporation of America, New York, will shortly open an office in Hong Kong, China. H. W. Wolcott and P. H. Duncan are sailing for the Orient in the interests of the company. Mr. Duncan will take charge of the Shanghai office and later open the new office in Hong Kong, which will be under his jurisdiction. Mr. Wolcott, leaving with Mr. Duncan, will visit Calcutta, India and Soerbaya, Dutch East Indies, to establish connections.

Wonham, Bates & Goode, Inc., 17 Battery Place, New York, exporter, importer and manufacturer representatives, has changed its name to Wonham, Bates, Goode Trading Corporation. The new organization includes E. Naumburg & Co., New York, and M. Samuel & Co., Ltd., London. The management of the company will remain the same, the following having been added to the board of directors: George W. Naumburg and William S. Hernon of E. Naumburg & Co.; Major Julian Day, M. Samuel & Co., Ltd.; and Myron S. Falk, chairman of the board.

Chile-American Scholarship at Massachusetts Institute of Technology

The Chile-American Association, which was organized in 1918 for the purpose of promoting good relations between Chile and the United States, has adopted a concrete measure as part of its general program, by establishing a mining scholarship at Massachusetts Institute of Technology. The scholarship includes both mining and metallurgy. A considerable number of Chileans now come to the United States to pursue technical and scientific courses with a view to fitting themselves for industrial careers. Since the great war there has been a marked increase in the number of young Chileans who look forward to work of this character.

More than $200,000,000 of North American money is invested in Chile, according to official reports of the United States Government. The bulk of these investments are in mining enterprises, since Chile basically is a mineral country and her future industrial and commercial status depends largely on the development of her copper and iron fields as well as of her nitrates.

Taking note of this condition the association, in adopting the policy of establishing scholarships at the educational institutes of the United States, has begun with the establishment of the Chile-American Association Mining Scholarship at the Massachusetts Institute of Technology. The scholarship embraces both mining and metallurgy. Definite and liberal financial provision has been made for a full three years' course at the Institute leading up to a grade degree. A sufficient sum has been appropriated to cover travel expenses and the student's maintenance.

With a view to affording equal opportunity to ambitious and deserving young Chileans, who have decided to follow mining as a career, the selection is to be made by competitive examination from among recently graduated students of Chilean mining schools. A sufficient sum is also appropriated to cover travel expenses and the student's maintenance for three years. The administration of the scholarship will be under the direction of the members of the Association in the United States in co-ordination with the Ambassador of Chile in Washington.

The members of the Chile-American Association are: American Smelting & Refining Co., American International Corporation, Bethlehem Chile Iron Mines Co., Chile Exploration Co., Braden Copper Co., Chile Steamship Co., Andes Copper Mining Co., Santiago Mining Co., E. I. duPont de Nemours Export Co., International General Electric Co., Ingersoll-Rand Co., W. R. Grace & Co., Singer Sewing Machine Co., J. P. Morgan & Co., National City Bank, Errazuriz Simpson & Co.

General Electric Plant for Philadelphia

The General Electric Co. has asked the public works committee of Philadelphia to strike two unopened streets from the city plan to permit the construction of a new plant in that city which will occupy two city blocks on Elmwood Avenue, from Sixty-eighth to Seventieth streets. Purchase of the land by the General Electric Co., it was stated, is contingent upon favorable action by the Philadelphia council. The company plans to build five factory buildings, 80 x 600 ft. each, at a cost of about $5,000,000. Employment will be given to 20,000 persons.

May Build British Tankers

BIRMINGHAM, ALA., March 2.—The Mobile Shipbuilding Co. has an offer of contract by British interest for the building of 20 steel tankers, and proposes to accept the job if the Birmingham Steel Corporation, an associated concern, is able to secure the steel for fabricating the shapes. The Mobile concern is at present building 6500-ton steel freighters for the Emergency Fleet Corporation.

Thompson Will Be Tried

PITTSBURGH, March 2.—The Supreme Court at Washington has set aside federal court decrees quashing indictments returned at Erie, Pa., against Josiah V. Thompson, the well-known former coal and coke operator in the Connellsville district. Mr. Thompson will have to stand court trial on charges of misapplication and embezzlement of funds while president of the First National Bank of Uniontown, Pa.

Magnus W. Alexander, general manager National Industrial Conference Board, spoke to 60 young men interested in electrical engineering at the Engineers' Club, Boston, recently, in place of Richard H. Rice, general manager, General Electric Co., Lynn, who was unable to attend. Discussion centered largely on what is expected by industry from the apprentice school and what rewards it has to offer the apprentice graduate.

Albert I. Lauer, secretary-treasurer, Briggs & Turivas, scrap brokers, Chicago and New York, was apprehended by Government officers in Chicago on Feb. 17, on the charge of offering an internal revenue agent a $15,000 bribe. It is alleged that the sum was tendered as an inducement to put falsified income tax returns through the internal revenue department.

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The End of the Steel Suit

The decision of the United States Supreme Court on Monday in favor of the United States Steel Corporation ends the famous dissolution suit in the way in which public opinion wanted to have it ended. In the nearly five years since Judge Buffington gave the unanimous decision of the four judges in the Circuit Court of Appeals there has been no reversal of the approval then expressed by the Steel Corporation's competitors, its customers and by the public as represented by newspaper comment from every quarter of the country. The corporation's record of co-operation with the Government in the war period, while it could have no place in the court proceeding, certainly has created no popular prejudice against an industrial organization able and willing to put quickly at the disposal of the country greater war resources than exist anywhere else in the world under one management.

The ground on which a dissolution order was denied by the Supreme Court is, in brief, that the public interest would suffer were such an order made. Here we find the "rule of reason" which the Supreme Court laid down as its guiding principle in the enforcement of the Sherman act when it said in the Standard Oil Co. decision of May, 1911:

> In every case where it is claimed that an act or acts are in violation of the statute the rule of reason, in the light of the principles of law and the public policy which the act embodies, must be applied.

The Sherman act continues in its baffling, Delphic role of more than 35 years, but as decision under it follows decision it is made more clear that it is not to be used to hobble enterprise or to be suspended as a sword of Damocles over legitimate business.

The Trenton decision, which was affirmed at Washington Monday, turned largely on the good conduct of the Steel Corporation. Two of the four judges in the Trenton court held, in the opinion then given by Judge Woolley, that the promoters of the Steel Corporation violated the Sherman act in organizing it, and that their intentions were of monopoly and restraint of trade. The corporation itself, however, these judges found, did not exercise control of prices, but associated and co-operated with its competitors, as in the Gary dinners, which showed that of itself it never possessed sufficient power to control prices of the products of the industry. The Supreme Court follows the Trenton court in holding that the Gary dinners amounted to "a combination or common action forbidden by law," but it found that this illegal practice was given up before the dissolution suit was brought, and that no evidence was presented of an intention to resume it.

It will be recalled that the court at Trenton offered to retain jurisdiction of the case so as to issue a restraining order if at any time the Steel Corporation and its competitors resumed co-operation. The majority decision at Washington Monday holds that the Government cannot fear such resumption of co-operation "for it did not avail itself of the offer of the district court to retain jurisdiction of the cause in order that if illegal acts should be attempted they could be restrained."

The fact that the decision is supported by the narrow majority of one, which might be changed to a majority of one on the other side, in any similar case in which Justices Brandeis and McReynolds participated, is not to be overlooked. It is not encouraging to the proposal for a second large aggregation of steel companies of which much has been heard at intervals in the past two or three years. Such a consolidation if formed would not be in danger of dissolution because of its size, as both the minority and majority decisions of this week distinguish clearly between size and conduct as ground for proceedings under the Sherman act. But the courts could not be expected to overlook the new situation that would be created by the existence of two powerful consolidations controlling together, say 85 to 90 per cent of the country's output of steel. There is also to be considered the effect a new consolidation in the steel industry would have upon the proceedings now before the Federal Trade Commission, commonly known as the Pittsburgh basing case, in which complainants charge that the Steel Corporation and various other steel companies, by means of the Pittsburgh basing are discriminating against Western consumers "by agreement or understand-

ing amounting to agreement . . . in order to maintain prices of rolled steel."

In the nearly nine years in which the fate of the Steel Corporation has been in the balance the care and circumspection of its walk and conversation have become well nigh proverbial in the steel trade. Nothing it has done has been or could be hid, and its policy of full publicity has become more and more the policy of all corporations that have had any measure of public confidence. Whatever trust menace may have existed in the steel industry is gone to-day. The problem yet to be worked out is how to maintain prices for steel products that shall be fair to the consumer and insure a reasonable and continuous profit to the investor. The exigencies of the war period developed Government regulation, and the abnormal situation since the war has permitted no return to ordinary competitive conditions. For the future the alternative is some form of Government regulation under the direction of the Federal Trade Commission or the old regime of feast and famine. If consolidation in the steel trade goes further, Government oversight and an effort to stabilize prices seem highly probable.

Labor's Inefficiency Evaluated

How much the labor factor affected profits in iron and steel making in 1919, not counting the strike in the last quarter, is indicated in annual financial reports now appearing. A general compilation when all these reports are in ought to be quite illuminating. Some of them will show how much more of every dollar received by the maker last year went into the hands of the employee than in preceding years, and how much less he produced not merely in terms of the dollar but in terms of weight.

The total production in a year may be divided by the average number employed throughout the year to get the average per capita output. The necessarily diminished unit performance of the strike period because of irregular and unbalanced operation is compensated for by considering the average number engaged. The effect on profits of an overhead which becomes relatively heavy in periods of low demand is one thing, but reduced manual performance added to extraneous obstacles at a time of heavy demand, as in most of 1919, is quite another.

The annual report of the Republic Iron & Steel Co. shows that for every dollar of gross sales nearly 47c. went into the payroll in 1919. In 1918 for every dollar of sales 31.6c. went to the employee in wages. In 1917 the payroll percentage of gross sales was 22.4, in 1916 24.2, and in 1915 28.6.

The average pay per man in 1914 was $766 and in 1919 $1,822, or an increase of 138 per cent. There would be no quarrel with this advance if there were some corresponding increase in the output per capita. In 1919 the gross sales amounted to $3,900 per employee, while in 1918 the gross sales per capita figured at $5,130, in 1917 $5,400, in 1916 $4,050, and in 1915 $2,700, the last being a year in which the average prices on shipments were low. While these figures show how much less in value were the sales per man employed, an estimate of the actual tonnage is more specifically illustrative of diminished unit output. For purposes of comparison the annual pig iron production of the company added to one-half the total of steel ingots may be taken as a rough basis. In short, we may regard one-half of the ingot capacity as representing steel scrap and the other one-half pig iron, leaving the surplus of pig iron for sale in the general pig iron market; therefore, the production of the company may be regarded, for purposes of this comparison, as made up of merchant pig iron and steel ingots.

Since 1915 and 1916, a diminishing scale of output is shown. This is partly to be attributed, of course, to a reduction in the amount of heavy tonnage products, particularly in the last year when the variety of normal demands of peace time brought about some reduction in per capita output. On the basis of the total production of crude products (which, it must be emphasized, is not actual but merely selected as a means of measurement), the output was 99 tons per man in 1919, 108 in 1918, 113 in 1917, 134 in 1916 and 142 in 1915.

The large amount of the income which went into the hands of labor and the diminishing production, partly through the greater diversification of the demand, but also because of the continuing prevalence of the war spirit and its unrest, are indicative of the difficulties which at least some of our steel producers have had in conducting a profitable business, even under advancing prices. The justification for the prices seems thus well proved.

Electricity and Non-Ferrous Metals

The use of the electric furnace for melting non-ferrous metals and alloys has increased more rapidly than has been commonly appreciated, and the facts given elsewhere in this issue will come as a distinct surprise to most of those not in direct touch with the industry. This first survey is similar to that annually published in these columns reviewing the electric steel industry.

According to these data there are at present in the United States no fewer than 261 electric furnaces of various types operating or contracted for, which are devoted to the brass, copper, zinc, aluminum or non-ferrous alloy industries. This development has largely taken place in the last two years. The comparison with the similar progress in the electric steel industry is very striking, for from 1913 to 1918 inclusive electric furnaces operating in the steel industry increased from 19 to 233, the total in five years thus being less than was reached in the non-ferrous industry in two years.

Comparisons are only possible, however, in a numerical way, for operating conditions are essentially different in the two industries. In steel the function of the electric furnace is in most cases a refining one, whereas in the non-ferrous industry it is used as a melting medium. Electrical and other problems are decidedly different. In the early trials much difficulty was found in melting yellow brasses because of the heavy loss of zinc

due to high temperatures. That this has been overcome is evidenced by the fact that at least 170 of the 261 furnaces are now devoted to the yellow brass industry.

Taking the Baily furnace as typical of the progress of the industry, its first installation was in 1914 for melting silver, then came one in 1916, five in 1917 and 12 in 1918. In 1919 and early 1920 the remaining 48 furnaces have been sold. Besides this there have developed, largely in the last two years, the other prominent types with their numerous installations.

From the melting of silver and bearing-metal alloys the use of electricity as a melting medium has spread to brass of all kinds, coinage metals and alloys, aluminum and some of its alloys and into other fields. The constant appearance of new non-ferrous alloys, some involving the use of the rarer metals, the new uses for the more common alloys and metals and the unlimited possibilities for new combinations warrant the statement that the future use of the electric furnace in this industry is not only sure to expand but that it may make possible results not now apparent.

Proposed Department of Public Works

There are various ways of economizing. In our issue last week we referred to the so-called mathematical economizing by which the appropriations committee of the House of Representatives at Washington has undertaken to curtail the research work of the Bureau of Standards and the promotion of foreign commerce by the Bureau of Foreign and Domestic Commerce. As evidenced by action taken at meetings of manufacturers and other ways, it is clear that this method of dealing with important work of the Government is not popular. It is being denounced as it should be and hope is entertained that wiser policies will yet prevail.

While the statesmen at the national capital are looking about for means of economizing, they would do well to consider what is known as the Jones-Reavis bill, providing for the establishment of a National Department of Public Works to succeed the Department of the Interior. The idea is to transfer to other departments from the present Department of the Interior the patent office, bureau of pensions, bureau of education and other bureaus which do not belong there and concentrate all of the engineering, architectural and other construction work in the new department. The Government's construction work in 1921, it is estimated, will amount to over $788,000,000, and if the present arrangement continues, the expenditure of this amount will be under the control of 39 separate agencies scattered through nine departments of the Government and four unattached bureaus. The result will be confusion, extravagance, duplication and possibly dishonesty. It is believed that the proposed plan would result in a great saving, and that other important results would follow is pointed out by Prof. George F. Swain of the School of Engineering, Harvard University, in his recent address, reported elsewhere in these columns.

Differences of opinion will arise as to details of the bill, although it is a very simple measure of about six printed pages. As drawn it is necessarily tentative and can be changed as to details, but the general plan is one that commends itself strongly to engineers and business men and to many others who are familiar with the present unsatisfactory methods.

CORRESPONDENCE

Shortsighted Trade Unionism

To the Editor: Recently the following news item which appeared in a prominent trade journal attracted my attention. I cannot vouch for the truth of the statement, but I have known of other cases equally preposterous:

> At the Union Station in Birmingham, according to Robert Small, a reliable correspondent in Washington, two men were employed as firemen, one having the day and the other the night shift. One of them was required to turn on the station electric lights in the evening; the other to turn them off in the morning.
>
> The electricians entered into a new working agreement with the Southern Railway. A walking delegate appeared and told the two firemen that they were entitled to be rated as electricians because they turned the lights on and off. The firemen thereupon applied for the advance rating. They got it. More than that, each was given $2000 in back pay under a retroactive clause!
>
> Many instances of the same sort of wild and criminal extravagance keep coming to light. No wonder that labor is demoralized, and no wonder that freight rates are high.
>
> The incident is indicative of what can always be expected under Government ownership or control.

Some years ago a steamship was lying at a dock in New York undergoing refitting for passenger trade. Carpenters and electric light fitters were working harmoniously side by side, both belonging to unions having different rules.

The carpenters' rule, if I remember rightly, permitted the members to bore holes in wood that was, let us say, 2 in. thick or over. The fitters' rule permitted the men to bore holes in wood less than 2 in. thick. A long, wedge-shaped, curved plank was about 4 in. thick at one end and ½ in. thick at the other end. When the carpenters who had bored holes about 2 in. apart, beginning at the thick end, approached the place where the plank tapered off to about 2 in. thick, the fitters called a halt, and the argument became so heated that a free fight ensued, requiring intervention of police and holding up the job for the best part of a day, entailing a loss of hundreds of dollars to the ship owners, who were not consulted at all!

I recall an amusing personal experience that occurred to me nearly 20 years ago. I opened the door of my laboratory in a large manufacturing establishment which, by the way, was an "open shop," and drove a small nail into a board, in view of some workmen. One of the men stepped forward and said, "Excuse me, sir, but you oughtn't to have done that." I said, "Why?" He replied, "Oh, you might have hurt your thumb." I said, "Well, I didn't hurt it." Then he said, "If you'd had a union card I wouldn't of said nothin'!" And he walked away.

In 1903 I gave an address on "Trades Unionism" to students of the Wharton School of Finance, on the request of their teacher, which appeared in "The Annals of the American Academy of Political and Social Science" in November of that year, in which it was said in the introduction that "Trades unions are combinations of workmen of various trades for the mutual support and advancement of what the association considers its best interest. For their origin we must look back at least to the guilds of the Middle Ages—before the introduction of the factory system or of any but the crudest mechanical devices. . . . In 1776 we

find Adam Smith writing, as of a familiar thing, of combinations of workmen to collectively force up the price of their labor. Such combinations were regarded in England as late as 1824 as conspiracies in restraint of trade and illegal."

Wonderful changes have taken place since that time; labor laws without end have been passed in favor of collective bargaining; the workman is no longer a serf, he is guarded in every way against oppression, and wages have advanced to a degree that was unimaginable only a few years ago.

Workmen have been permitted to share in the profits of many of the largest industrial establishments. Compensation laws protect workers in case of accident. "Group insurance" is becoming popular, in which the employer *pays all of the premiums* and the beneficiary is promptly paid in case of death of the insured employee, whether due to accident or sickness.

The hours of labor have been progressively lessened and other advantages, far too numerous to mention in a brief communication, have been gained by labor. Yet it appears that labor is never satisfied, and probably never will be.

Trades unionism has undoubtedly been a strong lever in elevating labor, but, alas! it has been cursed by bad leadership in too many cases. Wherever it has striven to raise the standard of efficiency of its members, the union card has been regarded as a recommendation of efficiency and good character, and this should be the legitimate aim of trades unionism.

The concluding paragraph of the address alluded to is as follows: "Radical leadership has made most of our unions unsuccessful and given them a name for bad faith and for mean and petty action. There is reason for hope in the improvement during the past few years in the leadership of some that gradually all will select either their own most fit representatives or that labor leaders will be trained to their calling as are lawyers or generals. When they do profit by the example of the most successful much of the present prejudice against them will be forgotten, and a man with a union card will have a certificate of efficiency and good character. When these are the effects of unionism upon labor the employer will welcome and encourage the movement as one of the modern agencies for doing the world's work expeditiously and economically."

The wish was, I fear, "father to the thought" in the foregoing remarks; yet I do not despair that in the future education will supplant ignorance now responsible for so many of the mistakes of trades unionism.

ALEXANDER E. OUTERBRIDGE, JR.

1600 Hamilton Street,
Philadelphia, Feb. 20.

Italy's Need of White Coal at Any Cost

To the Editor: I have just read in THE IRON AGE of Dec. 4, 1919, page 1157, the report sent by A. P. Dennis, U. S. Commercial Attaché in Rome, regarding the new Ansaldo Works in Val d'Aosta (Northern Italy).

The purpose of this letter is not to enter into a discussion regarding the commercial results of Ansaldo's enterprise, but because I think it would interest you to know that I am under the impression that the writer of the report mentioned seems to have been misinformed about the conditions of the steel industry in Italy.

Italy is almost entirely lacking in coal, but this seems to be overlooked by our American friends. It, therefore, happens when America, England or Germany does not deliver coal to Italy, or delivers only very insufficient quantities (as is the case over several years), that we cannot maintain our coal-burning furnaces for steel and iron production. There is nothing more logical than to utilize our white coal, even if the cost of the production of iron is higher than using black coal for the same purpose.

If we would not try to utilize our natural resources, we would be forever at the mercy of the foreign countries for all our pig iron needs, which are not so small as they were about 10 years ago.

The author of the report evidently ignores the fact that to-day hematite pig iron costs more than 750 lires per ton and that even at this price it is not very easy to obtain large quantities. Therefore, hematite pig iron produced with electric furnaces can be sold still with good profit.

The report finally states that German pig iron is offered in Italy at 40 per cent less than Ansaldo's cost prices. Now everybody knows that German pig iron has not been arriving in Italy for several years at any price, and our hopes that this state of affairs will soon cease are not very high.

A. L. A.

Milan, Italy.

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PRODUCTION INCREASED

Pig-Iron Output in February 5500 Tons a Day Greater

A Net Gain of 14 Furnaces—Ferroalloy Tonnage 17 Per Cent Greater Than in January

The production of coke and anthracite blast furnaces in February, a 29-day month, amounted to 2,978,879 gross tons or an average of 102,720 tons daily as compared with 3,015,181 tons or 97,264 tons daily in January, a 31-day month, and 2,940,168 tons or 105,006 tons daily in February, 1919, a 28-day month. On March 1 there were 304 furnaces of an estimated daily capacity of 104,580 gross tons active as compared with 290 furnaces of an estimated capacity of 99,465 tons in blast Feb. 1, 21 having been blown in and 7 blown out in the past month. The output of ferroalloys in March was 28,038 tons, exceeding January production by 17 per cent.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for February, and the three months preceding:

Pig Iron Production by Districts—Gross Tons

	Feb. (29 days)	Jan. (31 days)	Dec. (31 days)	Nov. (30 days)
New York	158,710	154,090	134,609	103,335
New Jersey	1,961	0	3,732	5,000
Lehigh Valley	65,881	99,382	81,347	100,402
Schuylkill Valley	94,541	95,569	80,901	69,876
Lower Susquehanna and Lebanon Valley	32,808	46,670	36 667	50,540
Pittsburgh district	686,903	695,442	653,273	646,122
Shenango Valley	147,358	150,977	146,822	147,795
Western Pennsylvania	163,092	164,616	144,432	83,867
Maryland Virginia and Kentucky	82,345	79,622	66,662	65,101
Wheeling district	117,597	83,630	57,325	16,801
Mahoning Valley	290,485	299,597	277,450	173,334
Central and Northern Ohio	284,985	267,861	206,020	195,107
Southern Ohio	77 443	64,461	64,124	62,726
Chicago district	466,453	487,840	385,399	376,378
Mich., Minn., Mo., Wis., Colo. and Wash.	99,244	98,487	77,164	64,730
Alabama	185,237	202,236	202,105	187,833
Tennessee	23,836	24,701	15,236	16,603
Total	2,978,879	3,015,181	2,633,268	2,392,350

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from February, 1919, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
February, 1919	78,910	26,096	105 006
March	73,468	26,217	99,685
April	61 289	21,318	82,607
May	51,187	16,815	68,002
June	51,865	18,630	70,495
July	61,503	16,837	78,340
August	68,018	20,478	88,496
September	60.954	21,978	82,932
October	41,796	18,319	60,115
November	57,589	22,156	79,745
December	61,815	23,129	84.944
January, 1920	72,015	25,249	97 264
February	75,230	27,490	102,720

The figures for daily average production, beginning with January, 1914, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1914—Gross Tons

	1914	1915	1916	1917	1918	1919	1920
Jan.	60,808	51.659	102,746	101,643	77,799	106,525	97,264
Feb.	67 453	59,813	106,456	94,473	82,835	105,006	102,720
Mar.	75,738	66,575	107,667	104,882	103,648	99,685	.....
Apr.	75,655	70,550	107 592	111,165	109,607	82,607	.....
May	67,506	73,015	108,422	110,238	111,175	68,002	.....
June	63,916	79,361	107,053	109,002	110.793	70,495	.....
July	63,150	82,691	104,017	107,820	110 354	78,340	.....
Aug.	64,363	89,666	103,346	104,772	109,341	88,496	.....
Sept.	62,753	95,085	106 745	104,465	113,942	82,932	.....
Oct.	57,361	100,822	113,189	106,550	112,482	60,115	.....
Nov.	50,611	101,244	110,394	106,859	111 802	79,745	.....
Dec.	48,896	103,333	102,537	92,997	110,762	84,944	.....

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steelmaking iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total production			Spiegeleisen and ferromanganese		
	1918	1919	1920	1918	1919	1920
Jan.	1,756,208	2,430,022	2,232,455	30,695	32,787	23,957
Feb.	1,620,254	2,209,470	2,181,679	26,114	28,105	28,038
Mar.	2,349,419	2,277,507	.....	39,122	26,644	.....
Apr.	2,411,488	1,838,677	.....	35,511	17,308	.....
May	2,513,577	1,586,805	.....	54,633	14,604	.....
June	2,407,166	1,655,944	.....	44,844	14,254	.....
July	2,456,693	1,906 604	.....	51,762	14,805	.....
Aug.	2,509,357	2,108,566	.....	54,009	17,419	.....
Sept.	2,507 381	1,828,613	.....	66,275	20,631	.....
Oct.	2,594,277	1,295,690	.....	70,379	20,238	.....
Nov.	2,501,867	1,727,656	.....	59,638	19,964	.....
Dec.	2,524,794	1,916,249	.....	49,435	15,718	.....

Among the furnaces blown in are one Lackawanna and one Susquehanna in the Buffalo district; Musconetcong in New Jersey; Macungie in the Lehigh Valley; Edgar Thomson C, No. 1 Aliquippa and Soho in the Pittsburgh district; Atlantic in the Shenango Valley; one Buena Vista, Big Stone Gap and Pulaski in Virginia; one Ashland and one Grand Rivers in Kentucky; No. 2 LaBelle, No. 2 Mingo and Top Mill in the Wheeling District; Grace and one Hubbard in the Mahoning Valley; Newburgh in northern Ohio, and one South Chicago (old) in the Chicago district.

The furnaces blown out include Crumwold in the Lehigh Valley; Delaware River in the Schuylkill Valley; Jisco in southern Ohio; one Gary in Indiana; one Gadsden and one Ensley in Alabama.

Capacities in Blast March 1

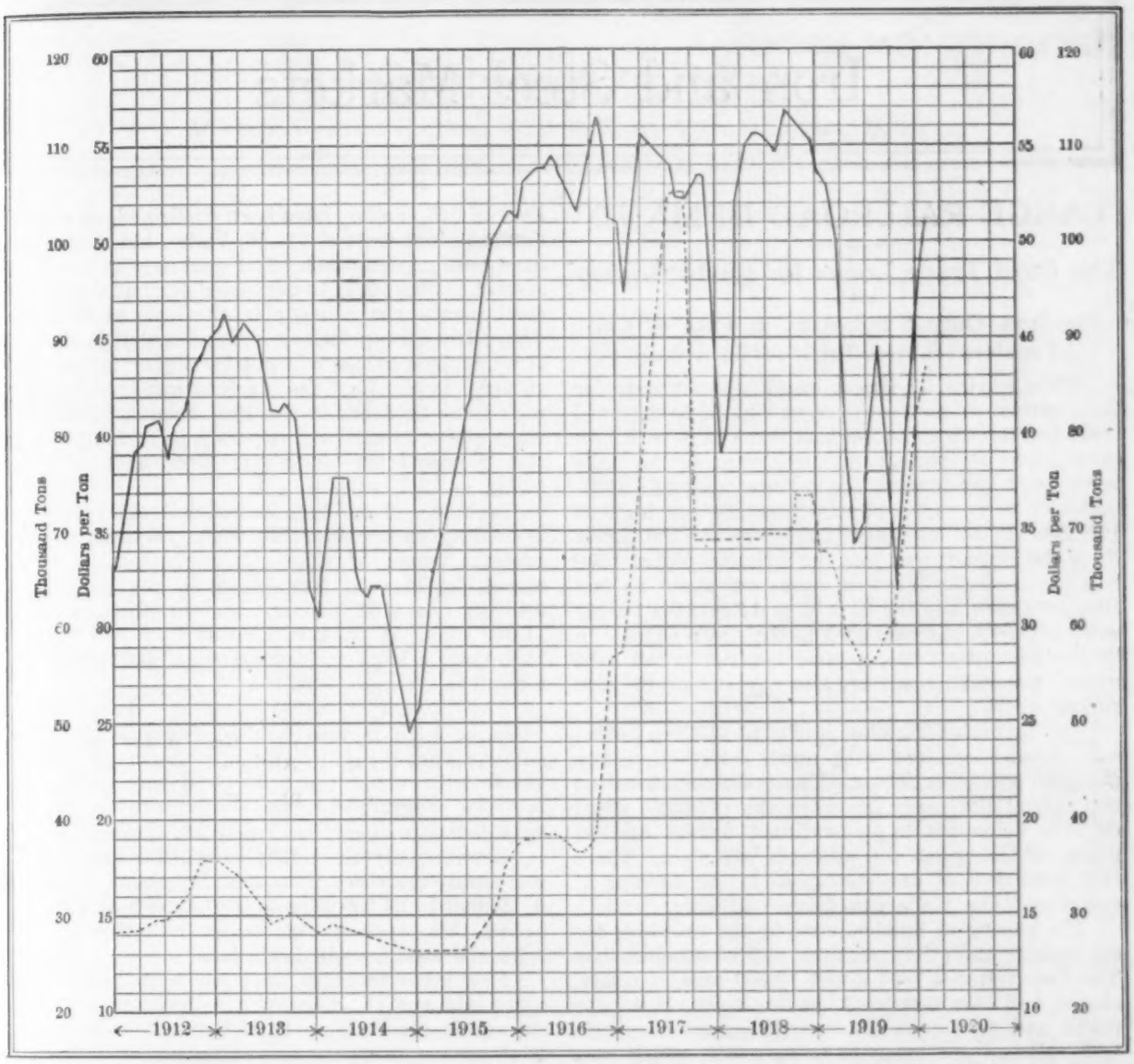
The following table shows the number of furnaces in blast March 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast Feb. 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces.	Total stacks	Mar. 1 In blast	Mar. 1 Capacity per day	Feb. 1 In blast	Feb. 1 Capacity per day
New York:					
Buffalo	22	16	5,620	14	4,760
Other New York	4	2	330	2	330
New Jersey	5	1	105	0	0
Pennsylvania:					
Lehigh Valley	18	10	2,060	10	2,360
Spiegel	2	2	185	2	200
Schuylkill Valley	15	11	3,300	12	3,450
Lower Susquehanna	8	2	630	2	630
Ferro	2	2	125	2	140
Lebanon Valley	9	2	350	2	390
Ferro	1	1	45	1	40
Pittsburgh district	53	52	23,590	49	22,130
Ferro and Spiegel	5	3	545	3	400
Shenango Valley	19	17	5,170	16	5,000
Western Penn.	27	19	5,565	19	5,385
Ferro	1	1	75	1	75
Maryland	4	4	1,265	4	1,265
Wheeling District	15	12	4,495	9	3,115
Ohio:					
Mahoning Valley	27	24	10,260	22	9,710
Central & North.	26	22	9,825	21	9,175
Southern	17	12	2,625	13	2,125
Illinois and Ind.	39	34	16,325	33	16,315
Ferro	1	0	0	1	100
Mich., Wis. and Minn.	13	7	2,435	7	3,070
Colo., Mo. and Wash.	8	3	1,000	3	835
The South:					
Virginia	17	10	1,190	7	805
Kentucky	7	5	650	3	345
Alabama	45	21	5,965	23	6,455
Tennessee	17	9	850	9	860
Total	428	304	104,580	290	99,465

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

at Chicago, and No. 2 X at Philadelphia. They are based on the weekly quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920
Jan.	3,185,121	3,150,938	2,411,768	3 302,260	3,015,181
Feb.	3,087,212	2,645,247	2,319 299	2,940,168	2,978,879
Mar.	3,337,691	3,251,352	3,213,091	3,090,243	.....
Apr.	3 227,768	3,334,960	3,288,211	2,478,218	.....
May	3,361,073	3,417,340	3,446,412	2,108,056	.....
June	3,211,588	3,270,055	3 323,791	2,114,863	.....
July	3,224,513	3,342,438	3,420,988	2,428,541	.....
Aug.	3 203,713	3,247,947	3,389,585	2,743,388	.....
Sept.	3,202,366	3,133,954	3,418,270	2,487,965	.....
Oct.	3,508,849	3,303,038	3 486,941	1,863,558	.....
Nov.	3,311,811	3,205,794	3,354,074	2,392,350	.....
Dec.	3 178,651	2,882,918	3,433,617	2,633,268	.....
Total, yr.*	39,039,356	38,185,981	38,506,047	30,582,878	.....

*These totals do not include charcoal pig iron. The 1918 production of this iron was 347,224 tons.

Blast Furnace Notes

The Otis Steel Co., Cleveland, blew in its No. 1 Cleveland furnace March 1. This furnace has been relined, its hearth enlarged and its daily capacity increased from 450 to 550 tons.

After being completely overhauled and relined, Grace blast furnace of the Brier Hill Steel Co. at Youngstown, Ohio, has been blown in, leaving only two idle stacks in the Mahoning Valley, No. 3 in the East Youngstown group of the Youngstown Sheet & Tube Co. and the Niles furnace of the Carnegie Steel Co. The Sheet & Tube company stack is down for relining, while the Carnegie stack will resume as soon as fuel supply improves. This is the best blast furnace schedule in the Valley in many months, though metal output is held down by lack of fuel.

The No. 3 Ensley furnace of the Tennessee Coal, Iron & Railroad Co. was blown out Feb. 29.

Stockholders of the Crucible Steel Co. of America approved the increase of the common stock capitalization from $25,000,000 to $75,000,000 at a meeting on Feb. 16. The board will await the decision of the Supreme Court on the taxability of stock dividends before making a stock dividend distribution of any of the new stock. The sum of $500,000 monthly is being expended on improvements started during the war.

The Golden Co., 405 Lexington Avenue, New York, is exclusive American agent for Societe Genevoise d'Instruments de Physique, maker of comparators for the gaging of steel balls, ball bearings and machined parts; also universal measuring machines, reference gages, scientific instruments and dividing engines.

The War Department has placed a contract for 4,000,000 steel bullets of a new design with the Marlboro Metal Works, Marlboro, Mass. The Marlboro plant has been idle for several months.

Iron and Steel Markets

LARGE RAILROAD DEMAND

The Steel Trade Looks for Early Buying

Pig Iron Output Increased in Face of Car Troubles—Lower Price on Basic Iron

While buying by the railroads did not wait for their return to their owners on March 1, the steel trade has been busy in the past three days with new calculations of tonnage that will come to the mills in the next two months for railroad account. Estimates of early car contracts have gone as high as 100,000. In actual orders 2500 cars for the Santa Fe is the largest item, and the Erie has placed 1000 box cars. Three Western roads are about to buy 1000 cars each, and the L. & N. and Southern Pacific will build 1000 box cars each in their own shops. In locomotive orders, too, a good beginning has been made. Canadian roads are also negotiating for new rolling stock.

The favorable decision in the Steel Corporation suit, though received with much satisfaction, has not been a market factor. The main consideration throughout the trade has been the probable effect on mill deliveries to non-railroad buyers and on prices, of the orders the railroads will place. There is a good deal of uncertainty as to the amount of equipment the roads can finance at once.

The buying of finished steel by the railroads for car repairs and other purposes will be considerable. The Pennsylvania took about 10,000 tons of plates, shapes and bars last week, paying 3.50c. to 4c. for plates and 4c. for bars. Prompt shipment on certain railroad purchases is being made, which may mean that delivery troubles of some other buyers will not improve. Naturally specifications on $47 rails are going promptly to the mills, while those on $57 rails are held back.

Opposing views are coming out on developments in the next three months. It is known that some independent mills have no large bookings ahead, but much hinges on the rate at which transportation can be untangled. There is questioning of the high prices established for certain products; at the same time, the rigid attitude of sellers remains.

Car supply has not improved in the Central West. In the Pittsburgh district it has scarcely reached 65 per cent. At Youngstown output of finishing mills fell to 60 per cent from the same cause.

Pig iron production last month was at the highest rate since February, 1919. The total for the 29 days was 2,978,879 tons, or 102,720 tons per day, as against 3,015,181 tons in January, or 97,264 tons per day. In 1919 the February output was 105,006 tons per day.

On March 1 active blast furnaces numbered 304, a net gain of 14 in the past month. The capacity of these furnaces is 104,580 tons per day, which compares with 99,465 tons per day for 290 furnaces on Feb. 1. Surprisingly, in view of the recent obstacles to steel works operation, pig iron production March 1 was at the rate of more than 38,000,000 tons per year, or close to the average for 1917 and 1918. Some accumulation of pig iron at steel works is thus indicated.

The reports of sales of basic pig iron at Pittsburgh by steel companies at less than the recent level of $43, Valley, have been confirmed, as several thousand tons went at $41.50, Valley, but other sales have been made at $43. The weakness in the basic market is attributed to decreased demand due to the steel plants not being able to work at capacity. There is a strong feeling in the Pittsburgh district that pig iron prices will not be higher in the near future. In the East the pig iron market is strong, with some tendency in the Philadelphia district toward higher quotations. Operations of foundries in New England are being carried on with difficulty owing to fuel troubles.

Inability of builders to get deliveries on steel is holding up considerable work, yet a number of projects, some of them fairly large, are going ahead, lettings in New York in the past week totaling about 12,500 tons and in Chicago about 11,000 tons. A bank in Kansas City will require 7500 tons, a bank in New Orleans, 4000 tons, and a hotel in Chicago, 5000 tons.

The prolonged constriction in coke seems at variance with increased blast furnace operation, yet car supply in the Connellsville region is no better and output there declined last week. Unless the program changes, Government control of coke prices will end on April 30.

Counter currents in the market for heavy melting steel scrap are indicated in recent purchase of 20,000 to 25,000 tons at Pittsburgh at $29, followed this week by an easier situation in line with the weakness in basic iron.

New labor troubles, together with lack of raw materials and shortage of cars have created conditions in the steel trade of Great Britain similar to those in this country. English steel makers are unwilling sellers at any price. The majority of Welsh steel workers are on strike for a 40 per cent wage advance. The tin-plate industry is particularly threatened owing to the cutting off of supplies of bars. Workers are demanding 6-hr. shifts and labor already is insufficient. Output will be reduced 20 to 25 per cent if present demands are enforced.

Pittsburgh

PITTSBURGH, March 2.

The return of the railroads to private ownership on March 1 has created a strong feeling in the trade that, within a very short time, large orders from the railroads for cars, locomotives and general track equipment will be forthcoming, and will amount to many millions of dollars. It is admitted by every one, railroad officials and shippers, that the physical condition of all the railroads is bad, much worse than it has been for some years, and the railroads need a large number of locomotives and many thousands of cars before they will be in shape to properly handle the immense freight business of the country. For two or three years the Pennsylvania Railroad has been a heavy buyer of real estate in downtown Pittsburgh, and is known to have very extensive plans for the building of new terminals and it is also the intention of this road to eliminate the tunnel running under the city, giving an outlet to the Panhandle road. It is proposed to replace this tunnel by either overhead tracks, or in some other way, and likely a new bridge across the Monongahela River will be built. No definite announcement of Pennsylvania Railroad plans has yet been made, but this road, the Baltimore & Ohio, the Pittsburgh & Lake Erie and other smaller roads drawing traffic from Pittsburgh will

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 2, 1920	Feb. 24, 1920	Feb. 3, 1920	Mar. 4, 1919
No. 2 X, Philadelphia‡	$45.35	$45.35	$44.35	$36.15
No. 2, Valley furnace†	*41.00*	42.00	40.00	31.00
No. 2, Southern, Cin'ti†	43.60	43.60	43.60	34.60
No. 2, Birmingham, Ala†	40.00	40.00	40.00	31.00
No. 2, furnace, Chicago*	43.00	43.00	40.00	31.00
Basic, del'd, eastern Pa.	43.40	43.40	41.40	33.90
Basic, Valley furnace	*41.50*	43.00	40.00	30.00
Bessemer, Pittsburgh	43.40	43.40	42.40	33.60
Malleable, Chicago*	*43.00*	43.50	40.50	31.50
Malleable, Valley	*42.00*	43.00	42.00	31.50
Gray forge, Pittsburgh	42.40	42.40	41.40	31.40
L. S. charcoal, Chicago	57.50	57.50	55.50	38.85
Rails, Billets, Etc.,				
Per Gross Ton:				
Bess. rails, heavy, at mill	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	**60.00**	58.00	52.50	43.50
O.-h. billets, Pittsburgh	**60.00**	58.00	52.50	43.50
O.-h. sheet bars, P'gh	**65.00**	60.00	55.00	47.00
Forging billets, base, P'gh.	**80.00**	75.00	73.00	56.00
O.-h. billets, Philadelphia	64.10	64.10	59.10	47.50
Wire rods, Pittsburgh	**70.00**	65.00	60.00	57.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.25	4.25	3.75	3.145
Iron bars, Pittsburgh	**4.25**	4.00	4.00	2.90
Iron bars, Chicago	3.50	3.50	3.00	2.92
Steel bars, Pittsburgh	**3.50**	3.00	3.00	2.70
Steel bars, New York	**3.77**	3.27	3.27	2.97
Tank plates, Pittsburgh	3.50	3.50	3.50	3.00
Tank plates, New York	3.77	3.77	3.77	3.17
Beams, etc., Pittsburgh	**3.00**	2.70	2.70	2.80
Beams, etc., New York	**3.27**	2.97	2.97	3.07
Skelp, grooved steel, P'gh.	**2.75**	2.45	2.45	2.70
Skelp, sheared steel, P'gh.	**3.00**	2.65	2.65	3.00
Steel hoops, Pittsburgh	**4.00**	3.50	3.50	3.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire.	Mar. 2, 1920	Feb. 24, 1920	Feb. 3, 1920	Mar. 4, 1919
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	**5.50**	5.00	5.00	4.70
Sheets, galv., No. 28, P'gh.	**7.00**	6.50	6.50	6.05
Sheets, blue an'l'd, 9 and 10	**4.50**	4.25	4.25	3.90
Wire nails, Pittsburgh	*4.00*	4.50	4.50	3.50
Plain wire, Pittsburgh	3.50	3.50	3.50	3.25
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.35
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.35
Old Material,				
Per Gross Ton:				
Carwheels, Chicago	$34.50	$34.50	$39.00	$21.00
Carwheels, Philadelphia	42.50	42.50	40.00	23.00
Heavy steel scrap, P'gh.	27.00	27.00	28.00	14.00
Heavy steel scrap, Phila.	**25.50**	25.00	26.50	14.00
Heavy steel scrap, Ch'go.	*23.50*	24.00	25.00	15.00
No. 1 cast, Pittsburgh	34.00	34.00	34.00	18.00
No. 1 cast, Philadelphia	40.00	40.00	41.00	21.00
No. 1 cast, Ch'go (net ton)	**37.50**	37.00	39.50	20.50
No. 1 RR. wrot, Phila.	36.50	36.50	35.00	20.00
No. 1 RR, wrt., Ch'go (net)	26.00	26.00	27.50	15.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	$6.00	$4.25
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	7.00	7.00	7.00	5.00
Foundry coke, future	7.00	7.00	7.00	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*18.75*	19.25	19.50	15.75
Electrolytic copper, N. Y.	*18.75*	19.00	19.25	15.00
Spelter, St. Louis	*8.75*	9.00	9.00	6.25
Spelter, New York	*9.10*	9.35	9.35	6.60
Lead, St. Louis	**9.00**	8.75	8.45	5.00
Lead, New York	**9.25**	9.00	8.75	5.25
Tin, New York	*63.25*	64.00	59.00	72.50
Antimony (Asiatic), N. Y.	**11.87½**	11.62½	11.25	7.12½

spend millions of dollars in this city in the next five years. The creation by Congress of a revolving fund of $300,000,000 is expected to help out largely in the railroads in financing these betterments, also in the purchase of cars, locomotives and track equipment.

The decision of the Supreme Court that the United States Steel Corporation is not a trust, and has not acted in any way in restraint of trade, was most pleasing to the friends of the Steel Corporation in this district, and they are mostly its competitors. The service rendered by the Steel Corporation during the war, when it practically turned over its immense resources in the way of organization and in other ways, to the Government, has been recognized as doing much in the quick victory in the war that was secured after our country got actively into it.

The car situation in the Pittsburgh district is in terrible condition. W. V. Kuhn, former fuel administrator in Pittsburgh, and himself a large coal operator, said yesterday that the car shortage is now worse than at any time during the war and is a great drawback to the coal and steel industries. With the return of the railroads to private ownership, it is hoped that the car situation will soon improve. Coal operators will now be able to negotiate with railroad officials for cars, which they have not been able to do while the railroads were under Government control. There has been much activity in railroad circles here in the last few days, and already a number of leading roads have opened offices in Pittsburgh, and others will do so as soon as they can find office space, which is very scarce and almost impossible to get. The car supply in the Pittsburgh district in the past week was not over 65 per cent, and on some days was less.

The shortage in supply of fuel is cutting down more and more output of pig iron and finished steel products. In the Youngstown, Ohio, district, it is said that output of finishing steel mills is not over 60 per cent of normal. In the Pittsburgh district it is perhaps a little more. Inefficiency of labor is also responsible for low output, a case in point being that of a leading steel company which reports normal operations of about 90 per cent, and actual output of steel of about 60 per cent. It is hoped operating conditions will improve, but as yet there is nothing in sight to indicate that this will come soon. There has been some surplus collected of basic iron at some of the steel mills that have been making more pig iron than they have been melting, and have sold some in the open market at less than what was regarded as the basic price last week. The opinion is strong that the crest in prices of pig iron has been reached for the time being and that there may be a slight recession. Very heavy premiums continue to be paid for semi-finished steel and finished steel products where the seller will guarantee fairly prompt shipment. The acute shortage in supply of steel is likely to last for considerable time.

Pig Iron.—W. P. Snyder & Co. report the average price of basic iron, based on actual sales of about 56,000 tons in February, to have been $41.21 at Valley furnace, and on sales of about 26,000 tons of Bessemer in February to have been $41.54 at Valley furnace. A local steel company sold on Friday, Feb. 27, 2500 tons of basic iron to a local interest on the basis of $41.50 at Valley furnace, and on Tuesday, March 2, the same buyer purchased 2000 tons of basic from another source at the same price. We are also advised of a sale of 6000 tons of basic for second quarter delivery at $43, Valley furnace, so that the price of basic iron at this writing seems to range between $41.50 and $43 at Valley furnace. There are reports of a sale of about 3000 tons of basic iron to a local foundry at $40, Valley furnace, but this sale is not confirmed. There is little being done in Bessemer or foundry grades, but the market seems reasonably firm. Consumers of pig iron have evidently decided that prices are as high as they will go for the time being, and are more conservative in making new purchases. The

scarcity in coal and coke is still very great and every day or two one or more blast furnaces in the Pittsburgh and Valley districts have to bank, waiting for delayed shipments of coke to arrive.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being $1.40 per gross ton:

Basic	$41.00 to $43.00
Bessemer	42.00
Gray forge	41.00 to 42.00
No. 2 foundry	41.00 to 42.00
No. 3 foundry	39.50
Malleable, Valley	42.00 to 43.00

Ferroalloys.—There is such a great scarcity for 76 to 80 per cent ferromanganese that it has been quoted and has been sold at prices ranging all the way from $175 to $225, delivered. There is also a fair demand for ferromanganese for last half of the year delivery, prices quoted ranging from $160 to $165, delivered. We note sales of probably 500 tons of 76 to 80 per cent domestic ferromanganese at $160, delivered, for last half shipment.

We quote 76 to 80 per cent domestic ferromanganese $160 to $165 for second half delivered, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $85 to $90, and 18 to 22 per cent spiegeleisen at $55 to $57.50, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $56.50; 10 per cent, $59.50; 11 per cent, $62.50; 12 per cent, $66.10. We quote 6 per cent silvery iron, $45.75 to $46.25; 7 per cent, $50 to $50.50; 8 per cent, $52 to $52.50; 9 per cent, $54 to $54.50, and 10 per cent $56.50 to $57. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—A local interest that has been handling more or less tonnage in billets and sheet bars by direct purchase and in trades now states that it cannot obtain steel at any price, and is simply out of it. Sheet bars have been quoted at as high as $90 per ton at mill, but this price is above the market. It is possible that an automobile builder in distress for sheets might pay close to $90 for sheet bars for prompt shipment, and then make a conversion deal to have the bars rolled into sheets, in order to be insured of a supply of sheets. However, there have been actual sales of small lots of soft Bessemer or open-hearth billets at probably as high as $60 or higher, and sheet bars at $70 or higher. These prices represent figures that consumers of sheets might pay to get bars to have them rolled into sheets.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $60 to $65; 2 x 2-in. billets at $65 to $70; slabs, $60 to $65; sheet bars, $65 to $70, and forging billets, ordinary carbon, $80 base, all f.o.b. mill Pittsburgh or Youngstown.

Structural Material.—The inquiry is still very active, and local fabricators are filled up for four to six months. The McClintic-Marshall Co. has taken 140 tons for an engine house for the Ligonier Valley Railroad, Ligonier, Pa.; 700 tons for a power house for the Metropolitan Edison Co., Reading, Pa.; 3000 tons for an open-hearth building for the Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, and 2000 tons for an office building for the Pacific Telephone & Telegraph Co., Seattle, Wash. The Jones & Laughlin Steel Co. has taken 200 tons for a building for the Lovell Mfg. Co., Erie, Pa., and 900 tons of bridge work for the New York Central Railroad. The Fort Pitt Bridge Works has taken 700 tons for a foundry building for the Elmira Foundry Co., Elmira, N. Y. Fabricators report deliveries of plain material by the mills as very bad, due to the scarcity of cars. We continue to quote plain material, up to 15 in., from 2.45c., this being the price of the Carnegie Steel Co. for indefinite delivery, up to 3c. and 4c., prices depending upon delivery wanted and the tonnage involved in the order. It is reported here, and is probably true, that one Eastern mill has made considerable sales of plain material in this district for second quarter delivery on the basis of 4c., Pittsburgh. The two local interests rolling plain steel are reported sold up over the remainder of this year.

Plates.—As a direct result of the railroads going back to private ownership on March 1, some large inquiries for cars have already come up and many others are expected within a very short time. Local steel car builders have received an inquiry from the New York Central for 13,000 cars of various classes, and also 200 to 300 passenger cars. The Rock Island has a definite inquiry out for 3500 cars and local car builders now anticipate a very busy period in building cars to last for several years. The general demand for plates from all classes of consumers is abnormally heavy, and the plate mills are simply congested with orders. Promised delivery of plates inside of three to six months is almost impossible to get.

We now quote sheared plates of tank quality, ¼ in. and heavier, at 2.65c. to 2.90c. for very indefinite delivery, while prices on ¼-in. and heavier plates, named by mills that will agree to ship out in three or four to six months, range from 4c. to 5c. at mill.

Sheets.—Reports are that a leading automobile builder recently paid about 9c. per lb. for a round tonnage of automobile sheets for delivery over the next four or five months. The independent mills are quoting all kinds of prices, these depending upon whether the intending buyer is a regular customer and the delivery wanted. The shortage in supply of sheets is getting worse and some large consumers are bidding against each other with some mills to have their orders placed, prices being a secondary consideration.

We now quote No. 28 gage box annealed, one-pass black sheets at 4.35c. to 8c.; No. 28 galvanized, 5.75c. to 8c., and No. 10 blue annealed at 3.55c. to 5.50c., the lower prices named being the March 21 schedules, which are no longer a factor in the market owing to sold-up condition of mills.

Tin Plate.—The car situation is certainly no better and the American Sheet & Tin Plate Co. is now said to have close to 50 000 tons of finished sheet and tin mill products piled in its various warehouses, awaiting cars for shipment. It is also said that the tin plate mills have orders on their books at present for close to 20,000,000 base boxes of tin plate, this quantity being the entire output of all the mills for about eight months. It is very evident that contracts for tin plate made last year for delivery first half of this year will not all be shipped out before third quarter, and shipments on some contracts may run into fourth quarter. Some consumers that are not getting delivery are combing the market to find tin plate for early shipment and are said to be offering $7.50 to $8 per base box to get it.

We now quote tin plate for domestic consumers and indefinite delivery at $7 per base box, wasters $7.50 to $8, and for export $9 to $9.50 per base box, all f.o.b. mill, Pittsburgh.

Wire Rods.—The new demand is heavy, but two local mills have stopped selling rods, stating their output is greatly reduced by the scarcity of steel, and they need all they can make for their own wire mills. We now quote soft Bessemer and open-hearth rods at $70 and high carbon rods at $75 to $100 at mill, prices depending upon the carbon content.

Wire Products.—A new card of extras on cement-coated nails has been sent out by several local mills in which the extras for cement-coated nails are the same as given in the new card for bright nails, printed on page 637 of THE IRON AGE of Feb. 26, with slight exceptions, and these are given in an article printed elsewhere in this issue. The demand for wire of all kinds and also for wire nails is still abnormally heavy, three or four of the leading makers being out of the market, and not quoting except occasionally to regular customers. The new card of wire nails has been very favorably received by the trade, and it is said the leading interest is preparing a new card. We quote wire nails at $3.25 base, this being the price of the American Steel & Wire Co. and $4 base on the new card issued recently by independent mills.

Hot-Rolled Strip Steel.—This material is extremely scarce, local makers being sold up for first half, and when quoting for delivery beyond that period leave the price open, to be the price in effect at the time delivery is made. We quote hot-rolled strips from 5c. to 7c. at mill, but the lower price will be named only to a regular customer and probably by only one or two makers.

Cold-Rolled Strip Steel.—Makers are sold up for three or four months and are turning away orders nearly every day, stating they cannot make the delivery. We quote cold-rolled strips at 7c. to 9c. per lb. at the mill.

Iron and Steel Bars.—The demand for both iron and steel bars is away beyond the capacity of the mills to meet. Small lots of steel bars have sold at very close to 5c., while the minimum price of one local maker of iron bars is 4.50c. and this concern will quote this price only to regular customers. All the iron and steel bar mills are filled up to July or longer, and the two leading makers of steel bars are fully sold up for the remainder of this year.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 4c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active and we quote these, when rolled into billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c., and refined iron bars 4.50c. to 5c. in carloads, f.o.b. mill, Pittsburgh.

Cold-Rolled Steel Bars.—Two local makers are entirely out of the market as sellers, being filled up to July, and not willing to sell for second half except at prices to be in effect at the time delivery is made. Cold-rolled steel bars are selling in small lots for fairly prompt delivery at 5c. to 6c. at mill.

Spikes.—Now that the railroads are back to private ownership, orders for standard spikes are pouring into the mills and two local makers say they are out of the market to July or longer. One Western road wants about 30,000 kegs, another 20,000 kegs and there are a number of smaller inquiries in the market. One local maker is now said to be quoting $4 base for standard spikes and is indifferent about selling.

We quote standard spikes, 9/16 x 4½ in., at $3.60 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅜ in. and 7/16 in., $4.25; 5/16 in., $5; boat and barge spikes, $4.25, f.o.b. Pittsburgh. Tie plates $3 to $4 per 100 lb.

Nuts, Bolts and Rivets.—The demand for nuts and bolts is very active, two leading automobile builders being in the market at present for enormous quantities of automobile bolts for last half of the year delivery. These orders, if placed, will likely be divided among three or four leading makers. The demand for rivets is heavy, structural rivets being firm at $4.50 and boiler rivets at $4.60 at mill. Discounts on nuts and bolts are given in detail on page 709.

Hoops and Bands.—One local maker is now quoting 5c. minimum on hoops and bands and will not shade that price. The Carnegie Steel Co. price remains at 3.05c., but this concern is fully sold up over the remainder of this year. We quote hoops and bands for fairly prompt delivery at 4.50c. to 5c. base, usual extras, f.o.b. mill.

Boiler Tubes.—Makers report a continued heavy demand for boiler tubes and inquiries are out for large quantities of locomotive tubes to cover orders for locomotives placed recently. Discounts on iron and steel tubes are given on page 709.

Iron and Steel Pipe.—It is the old story with tubular goods, nearly all the mills being absolutely filled up for the remainder of this year, and not quoting on any new inquiries. Numerous large oil and gas lines are projected, but when asked to bid on these lines, the mills turn them down, being unable to make the delivery this year. Output of tubular goods is greatly restricted by the scarcity of steel and shipments are held up by the scarcity of cars. Discounts on iron and steel pipe are given on page 709.

Coke.—Unless something intervenes in the meantime, Government control of prices on coal and coke will automatically expire on April 30. The supply of cars is no better, some days in the Connelsville regions being as low as 25 per cent. Output is falling off, due largely to shut down of plants for a few days at a time, waiting for cars in which to ship coke already made and piled in the yards. The output of coke last week was 235,157 tons, a decrease from the previous week of nearly 9000 tons. Government prices are $6 for spot and future furnace coke and $7 for foundry, in net tons at oven.

Iron and Steel Scrap.—A local consumer recently bought 20,000 to 25,000 tons of selected heavy steel melting scrap at $29 delivered, part of this business being taken by local dealers, and part by eastern dealers. This price was fully $1.50 per ton higher than the regular market, but is partly explained by the fact that the consumer could not draw on its reserve stock of scrap piled just outside the city limits, not being able to get cars to move it. The Pennsylvania Railroad Lines East scrap list for March, is the lightest sent out by this road for some months, containing only a little over 12,000 gross tons of all kinds. The weakness in prices of basic iron is reflected in the local scrap market. Prices on steel melting scrap are soft. Practically nothing is being done in the local market in the way of sales of scrap, consumers not buying and evidently waiting for lower prices which they believe will develop in the near future. No important sales of scrap on which to base actual prices have been made in this market in the past week.

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$27.00 to $27.50
No. 1 cast for steel plants	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	34.00 to 35.00
Compressed steel	23.00 to 23.50
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh district	18.00 to 18.50
Bundled steel stamping	17.00 to 17.50
No. 1 busheling	24.00 to 25.00
Railroad grate bars	28.00 to 29.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	31.00 to 32.00
Railroad malleable	31.00 to 32.00
Iron car axles	38.00 to 39.00
Locomotive axles, steel	33.00 to 34.00
Steel car axles	31.00 to 32.00
Cast iron wheels	41.00 to 42.00
Rolled steel wheels	29.00 to 30.00
Machine-shop turnings	17.50 to 18.00
Sheet bar crop ends (at origin)	30.00 to 30.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	33.00 to 34.00
Cast iron borings	19.50 to 20.00
No. 1 railroad wrought	33.00 to 34.00

Empire Steel & Iron Co. Report

The consolidated income account of the Empire Steel & Iron Co. and the Crane Iron Works for 1919 shows net profits after charges and Federal taxes amounting to $404,108, which is equivalent to $16.16 a share on the $2,500,000 preferred stock; in the previous year $19.38 a share was earned on the preferred stock. Following is the 1919 income account with comparisons;

	1919	1918	1917
Gross Income	$851,789	$1,207,029	$1,800,251
Interest, depreciation, etc.	389,681	212,526	182 076
Net income	426,108	994,503	1,618,175
Reserve for Federal taxes.	58,000	†510,000	†600,000
Net profits	404,108	484,503	1,018,175
Preferred dividends	150,000	250 000	387,500
Surplus	254,108	234,503	630,675

†Includes contingencies.

The Bay Verde Machinery & Supply Co. of Green Bay, Wis., has been incorporated with a capital stock of $50,000 and will engage in business as a wholesaler and jobber of machine tools, machinery and equipment for machine shops, woodworking plants, paper mills, sawmills, mines, garages and manual training schools. It has purchased a three-story building and will remodel it into a sales, display and storage building.

T. A. Willson & Co., Inc., Reading, Pa, manufacturer of various forms of eye-protectors, has changed its name to Willson Goggles, Inc. The ownership and personnel of the company remain unchanged. The change was made because the company's trade mark, "Willson Goggles," has become better known to buyers in the United States and foreign markets than the former name of the company.

The Alliance Steel Co., Alliance, Ohio, has been organized to build a sheet mill plant in that city. This company plans to erect an eight-mill plant for the manufacture of high grade sheets.

The Potter Motor Equipment Co. has been organized at Lima, Ohio, with a capital of $30,000. L. M. Potter and M. Austin Potter are the incorporators.

Chicago

CHICAGO, March 2.

Present indications point to large purchases of rolling stock by the railroads within the next few weeks. There is obviously a pressing need for cars and locomotives and it is believed that buying on a large scale will develop if builders can obtain steel from the mills. The need for new motive power is apparently more urgent than car requirements, as the carriers are vying with one another in their efforts to complete their specifications and place orders with the locomotive builders. Details regarding current inquiries and purchases of rolling stock are given elsewhere in this issue.

The entrance of the railroads into the steel market makes the position of the mills even more difficult than heretofore. While producers regard it as imperative to rehabilitate the transportation system as speedily as possible, their present heavy bookings constitute a limitation on the amount of material they can furnish for railroad purposes. The leading interest, which has taken a number of large orders from car builders of late, has reached the point where it can make no further commitments on bars whatever and none on plates and shapes until a thorough survey has been made of existing bookings in relation to operating prospects. There is apparently no let-up in the volume of inquiry emanating from other consumers, despite the difficulty in placing orders and the avowed intention of mills to give preferential treatment to railroad needs.

Fabricating awards are numerous and large new projects are making their appearance. During the past week, six lettings involved 1000 tons or more each and aggregated nearly 12,000 tons. The largest job now being figured on is the Kansas City Federal Reserve Bank, involving 2500 tons.

The expected advance in cast iron pipe has not yet materialized. The largest recent award in this commodity, calling for 15,000 tons, was made by Chicago to the United States Cast Iron Pipe & Foundry Co.

Bolt and nut makers have generally advanced their prices to the new level, the one exception being a large manufacturer, who has opened his books to old customers for second quarter shipment at the quotations adopted on Aug. 8, 1919.

Although foundries are exceedingly busy and have not generally covered for their last half needs, pig iron is rather quiet. Scrap continues to decline.

Mill operation is unchanged since a week ago. The announcement of the railroad maintenance and shop employees that they will confer in Chicago Thursday to prepare for a strike is causing some concern, as production would be seriously affected if the transportation situation should become any worse.

Plates.—While there is a disposition on the part of the local mills to give preference to railroad business, they are apprehensive that the demands which will be made on them will be greatly in excess of their ability to furnish steel. Previous bookings from other sources have been so heavy that there is a limit to what can be added even though the existing emergency calls for preferential treatment of railroad needs. The leading interest has undertaken to furnish about 6500 tons of plates, shapes and bars and 1700 tons of axles for 1250 refrigerator cars to be built by the Haskell & Barker Car Co. for the Santa Fe. The Steel Corporation will take no further orders for shapes and plates until it has made a careful survey of present commitments in relation to operating prospects. In bars, its books are so heavily loaded that no additional orders from any sources will be accepted. It is regarded as unlikely that steel recently ordered by car builders can be delivered before August. Other steel interests, including the leading local independent, are also disposed to assist the railroads to the best of their ability, but they do not propose to meet the Corporation prices. In the opinion of one of these producers, tonnage might be taken on at the war level of prices.

Pig Iron—The market is rather quiet, although by no means inactive. In the opinion of the trade, melters need iron and need it badly, but are deferring purchases for the time being because of the tight money situation. The activity of the foundries is evidenced by a recent incident in Wisconsin. A large agricultural machinery manufacturer there found its needs so much in excess of its own capacity and what it could sublet to other melters that it purchased a foundry outright. Although inquiries are less numerous, some fair sized tonnages are before the trade. An Illinois consumer wants 1000 tons of malleable and 1000 tons of foundry for last half shipment, and a Wisconsin foundry is inquiring for 2000 tons of malleable for the same delivery. A Chicago consumer has purchased 1200 tons of last half malleable at $42.50, Ohio furnace, subject to $3.10 freight. Southern iron appears to have weakened somewhat. Although two large producers are now quoting foundry at $42, base, Birmingham, three smaller makers have opened their books for last half at $40.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average, sil. 1.50 (other grades subject to usual differentials), delivered at Chicago	$57.50 to $60.50
Northern coke No. 1, sil. 2.25 to 2.75	45.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25	43.00 to 45.00
Northern high phos. foundry	43.00
Southern coke No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25	48.20 to 50.20
Southern coke, No. 2 foundry, sil. 2.25 to 2.75	46.70 to 48.70
Southern foundry, sil. 1.75 to 2.25	45.00 to 47.00
Malleable, not over 2.25 sil.	43.50
Basic	42.00
Low phos. (copper free)	50.00
Silvery, 7 per cent	56.40 to 56.80

Structural Material.—With both the leading interest and the foremost local independent sold up on shapes, fabricators must look to jobbers or other mills for material. Despite this difficult situation, awards are being made and numerous new inquiries are making their appearance. The plans for the Kansas City Federal Reserve Bank, calling for 7500 tons of steel, were sent out to-day by the architects, Graham, Anderson, Probst & White, of this city. Other inquiries include the Loridan Hotel, Chicago, 5000 tons, and the American Medical Association building, Chicago, 350 tons. Recent lettings follow:

Belden Hotel, Chicago, 3900 tons, to American Bridge Co.

Pacific Telephone & Telegraph Co., office building, Seattle, 1822 tons, to McClintic-Marshall Co.

Seng Co., industrial plant, Chicago, 1800 tons, to American Bridge Co.

Donaldson Block, Minneapolis, 1600 tons, to Minneapolis Steel & Machinery Co.

A. Starr-Best Co., store building, Chicago, 1300 tons, to American Bridge Co.

Nash Motors Co., body shop, Kenosha, Wis., 1100 tons, to American Bridge Co.

Rowley Brothers, machine and boiler shop, 212 tons, to Continental Bridge Co.

Uihlein Food Products Co., power house, Milwaukee, 200 tons, to Worden-Allen Co.

Recent inquiries include Buick Motor Co. powerhouse, Flint, Mich., 1000 tons.

The mill quotation is 2.45c. to 4.00c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Bars.—Few new orders for mild or rail carbon steel bars are being accepted by the mills. One hard steel bar mill in this district was forced to suspend operation early last week when its employees struck for a 15 per cent increase in wages. Bar iron continues to sell at from 3½c. to 3¾c. Chicago. Shipments of rail carbon bars are being invoiced at 3½c. mill.

Mill prices are: Mild steel bars, 2.35c. to 4.25c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.50c. to 3.75c., Chicago; rail carbon, 3.50c., mill. Jobbers quote 3.87c. for steel bars out of warehouse.

Sheets.—The leading interest is making every effor to assist its regular trade. To this end, it has averaged the purchases of customers during the last two or three years and has undertaken to supply them with a percentage of those totals. Despite this action, it is feared that some consumers will not receive sufficient material to prevent suspension of operation. The foremost independent, as well as outside mills, are unable to entertain new business. Manufacturers in the railroad car construction field complain that sheet mills have as yet taken no cognizance of the imperative need for new freight equipment. One of these interests recently sent inquiries to 12 producers but found none

willing to quote and only a few who promised to make quotation in April or May.

Mill quotations are: 4.35c. to 5.35c. for No. 28 black; 3.55c. to 4.50c. for No. 10 blue annealed, and 5.75c. to 6.75c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote, Chicago delivery out of stock: No. 10 blue annealed, 5.25c.; No. 28 black, 6.50c.; No. 28 galvanized, 8.00c.

Wire Products.—As the transportation situation has grown no worse, the leading interest has not been forced to add to the accumulation of shipments waiting for cars. It continues to bend every effort to assist its regular customers, but finds it particularly difficult to furnish products in an advanced stage of manufacture, such as roofing nails, fine wire and small wire nails. For prices, see finished iron and steel f.o.b. Pittsburgh, page 709.

Rails and Track Supplies.—The local mill is taking no further orders for standard section rails, but is accepting small lots of track supplies to help out old customers.

Standard railroad spikes, 3.35c. to 3.60c. Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c., f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Cast-Iron Pipe.—While some shops continue to sell at $4 and $5 above the market, particularly on small sizes, there has not yet been a general advance. Chicago has let 15,000 tons to the United States Cast Iron Pipe & Foundry Co. The same maker has been awarded 1500 tons by St. Louis. Jackson, Mich., has given 900 tons to the Lynchburg Foundry Co. Akron, Ohio, will take bids on 3155 tons March 5 and Milwaukee will take revised figures on 750 tons to-day. Stratford, Wis., is in the market for 180 tons.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $75.80; 6-in. and above, $72.80; class A and gas pipe, $2 extra.

Jobbers quote: Structural rivets, 5.37c.; boiler rivets, 5.47c.; machine bolts up to ⅞ x 4 in., 35 and 5 per cent off; larger sizes, 25 and 5 off; carriage bolts up to ⅞ x 6 in., 30 off; larger sizes, 20 off; hot pressed nuts, square tapped and hexagon tapped, $1 off; coach or lag screws, gimlet points, square heads, 40 and 5 per cent off. Quantity extras are unchanged.

Old Material.—Scrap prices continue to show weakness in the absence of buying by consumers. About the only activity to be noted during the past week was the sale of about 2000 tons of cast at from $37.50 to $39, and a small tonnage of No. 1 busheling which brought $20.75. The Rock Island has issued a list of about 4000 tons and the North Western and the Pennsylvania Lines West offer 300 tons each. The New York Central has issued a blind list.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$32.00 to $33.00
Relaying rails	40.00 to 50.00
Car wheels	34.50 to 35.00
Steel rails, rerolling	32.00 to 33.00
Steel rails, less than 3 ft.	28.00 to 28.50
Heavy melting steel	23.50 to 24.00
Frogs, switches and guards, cut apart	23.50 to 24.00
Shoveling steel	22.75 to 23.25
Low phos. heavy melting steel	28.00 to 29.00
Drop forge flashings	19.00 to 20.00
Per Net Ton	
Iron angles and splice bars	$30.00 to $31.00
Steel angle bars	23.50 to 24.00
Iron arch bars and transoms	30.50 to 31.50
Iron car axles	39.00 to 40.00
Steel car axles	31.00 to 32.00
No. 1 busheling	20.25 to 20.75
No. 2 busheling	14.00 to 14.50
Cut forge	23.50 to 24.00
Pipes and flues	18.00 to 18.50
No. 1 railroad wrought	26.00 to 26.50
No. 2 railroad wrought	23.50 to 24.00
Steel knuckles and couplers	26.50 to 27.00
Coil springs	27.00 to 27.50
No. 1 cast	37.50 to 38.00
Boiler punchings	24.00 to 24.50
Locomotive tires, smooth	25.00 to 25.50
Machine shop turnings	13.00 to 13.50
Cast borings	13.25 to 14.25
Stove plate	31.50 to 32.00
Grate bars	30.50 to 31.00
Brake shoes	26.00 to 26.50
Railroad malleable	28.00 to 29.00
Agricultural malleable	27.00 to 28.00
Country mixed	17.00 to 18.00

Bolts and Nuts—The prices generally quoted conform with the new quotations published under prices of finished iron and steel, f.o.b. Pittsburgh, page 709. One of the most important manufacturers, however, has opened its books to old customers for second quarter delivery at the prices prevailing on Aug. 8. This company, which has been out of the market for several months, believes it good economic policy to discourage what threatens to be a runaway market. Inquiry is even heavier than heretofore, numerous implement manufacturers having entered the market. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 709.

Ferroalloys.—Ferromanganese for prompt shipment has recently sold in this market at from $200 to $225, delivered. Ferrosilicon 50 per cent has softened and is available at $85, delivered.

We quote 76 to 80 per cent ferromanganese second half delivery, at $160 to $170 delivered; 50 per cent ferrosilicon at $90 delivered; spiegeleisen, prompt shipment, $200; 18 to 22 per cent, $60 furnace.

Boston

BOSTON, March 2.

Pig Iron.—Since last reports one house sold approximately 6000 tons Sloss-Sheffield second and last half iron at $42, f.o.b. furnace, for the former, and at $43 for the latter delivery. Most of it was for nearby delivery and No. 2 X Sloss-Sheffield and other Alabama irons are sent to Savannah and from there by water to Boston, the time involved being two weeks. The same house sold about 4000 tons eastern Pennsylvania No. 2 X and No. 1 X iron, second half, on a $43.50, f.o.b. furnace base. Another house sold 1000 tons Virginia No. 1 X iron, 1000 tons No. 2 X and 900 tons No. 2 X, second half, to jobbing foundries, at $42, f.o.b. furnace base. Sales otherwise have been few and far between, and in lots ranging from one car to 200 tons, at unchanged prices. Crane & Co., Bridgeport, Conn., are in the market for first half iron, and several other large consumers are uncovered on second half, including the Draper Corporation and the Walworth Mfg. Co. There is an inquiry for 5000 tons malleable in the market, and the General Electric Co. wants 900 tons for its Springfield, Mass., foundry. The Richmond Iron Works has sold 600 tons of charcoal iron to Pittsburgh district consumers at $65, f.o.b. furnace, and is out of the market for the rest of 1920. Delivered pig iron prices follow:

Eastern Pennsylvania silicon, 2.25 to 2.75	$46.90 to $49.15
Eastern Pennsylvania silicon, 1.75 to 2.25	45.65 to 47.90
Buffalo silicon, 2.25 to 2.75	48.15 to 50.15
Buffalo silicon, 1.75 to 2.25	46.90 to 48.90
Virginia silicon, 2.25 to 2.75	47.95
Virginia silicon, 1.75 to 2.25	46.70
*Alabama silicon, 2.25 to 2.75	47.35 to 50.35
*Alabama silicon, 1.75 to 2.25	45.75 to 48.75

*Alongside Boston prices.

Coke.—A fair business in last half coke at $13.95, delivered, has been put through during the past week, but many foundries covered at $11.90 when the books were opened by the producers for a few hours in February. The Providence Gas Co. has opened its books for the last half at $13.95, f.o.b. New England destination, plus any advance in freight rates. The New England Coal & Coke Co. foundry coke price is based on coal prices. A clause in its contract provides for an increase or decrease in accordance with the price of coal. The Providence Gas Co. contract has no such clause. During the past week the New England Coal & Coke Co. has sold on a $12.55 oven base for prompt delivery to consumers in Corry, Allentown and Emporium, Pa., Toledo and Detroit. It has sold some coke to Baltimore consumers.

Finished Iron and Steel.—One mill has raised prices on black sheets to $5 base, f.o.b. Pittsburgh, to $4.55 base on blue, and to $6.60 base on galvanized. All sheets are urgently needed throughout New England. The Bethlehem Steel Corporation will accept orders for universal plates to be rolled by its new mill at Sparrows Point. It will be some time, however, before the mill will roll a full range of sizes. Mill representatives are discriminating in accepting sheared plate orders, prices for which range above 4c., f.o.b. Pittsburgh. Bars are scarce and mills have all busi-

ness they care to handle. Some New England industries are in distress for steel. The New England Structural Co. is awarded about 200 tons for a local mercantile building. Stone & Webster are about to award 160 tons for a new Westinghouse Lamp Co., Milwaukee plant. The Fitzdale Paper Co., Lunenbury, Vt., paper mill, 500 tons, and the Waltham Foundry, Waltham, Mass., 125 tons, have been put over till next summer.

Warehouse Business.—The movement of iron and steel out of stock is light, owing to limited supplies occasioned by railroad embargoes, and prices are very strong, although unchanged. Jobbers have advanced prices on machine and common carriage bolts, tap bolts, bolt ends and small rivets, discounts in some instances being eliminated. Canadian nails offered here are not selling well, owing to the high prices asked for them.

Pipe.—The wrought pipe supply in New England is growing exceptionally short. Consumers' stocks are beginning to show the effects of railroad embargoes and jobbing stocks in some instances are almost eliminated. In fact, all kinds of pipe are scarce. Prices remain strong, but unchanged. Mills will not accept business.

Tool Steel.—Local prices on high-speed steel have been cut 10 to 25c. a pound, offers of $1.25 base being made openly. Some sellers are trying to press sales. Ordinary tool steel quotations remain unchanged, with business of small proportions.

Ordinary tool steel, 16c. per lb. base; extra, 19c. base; special, 24c. base; double special, 66c. base; non-changeable, 36c. base; high speed steel, $1.25 to $1.40 base. Mill shipments are quoted at 1c. per lb. less.

Old Material.—The heavy melting steel market is stronger on buying by Pennsylvania consumers, who have paid as high as $28 delivered, or within 50c. of the high price of 1920. Dealers have offered $33 for railroad wrought and one consumer paid $34, f.o.b. yard, but little is available. Pennsylvania rolling mills bought eight cars of shafting at $33.50, f.o.b. yard. They also have bought machine shop turnings, but in a small way. One thousand tons of car wheels are offered on this market with no takers. No. 1 machinery cast is in better request, with several sales to foundries at $42.50, delivered, and 200 tons of stove plate at $28.50, f.o.b. shipping point were taken by a dealer. Little No. 2 cast or mixed has changed hands. Virtually every transaction in old material since last reports was for prompt delivery. Nothing is wanted on future contracts. The Boston & Maine Railroad on Saturday sold fourteen cars of mixed scrap. Prices as quoted at the local yards follow:

No. 1 heavy melting steel	$22.50 to $23.50
No. 1 railroad wrought	32.00 to 33.00
No. 1 yard wrought	25.00 to 26.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	20.50 to 21.50
Machine-shop turnings	16.50 to 17.50
Cast iron borings	19.50 to 20.50
Heavy axle turnings	18.00 to 19.00
Blast furnace borings and turnings	15.00 to 16.00
Forged scrap	16.50 to 17.50
Bundled skeleton	16.50 to 17.50
Steel car axles	31.00 to 32.00
Car wheels	36.50 to 37.50
Machinery cast	39.00 to 40.00
No. 2 cast	37.00 to 38.00
Stove plate	27.50 to 28.50
Railroad malleable	28.00 to 29.00
Rerolling rails	29.00 to 30.00

Birmingham

Birmingham, Ala., March 1.

Pig Iron.—Birmingham iron sold during the last week of February at five different prices, namely, $38, $40, $41, $42 and $43. The bulk of this business, placed during the fore part of the week, was at $40. One of the largest foundry producers advanced its third quarter price to $42 and made a few sales at that figure, and in at least one instance secured $43 on a small lot. Another prominent interest, which sold first half iron at $40, advanced to $42 for last half and sold small lots at that figure. One of the most conservative of the foundry interests, which had heretofore not attempted going beyond $40, after selling around 6000 tons at that price, asked $41 and sold several small lots. In one or two instances it booked at $42. As far as the independents are concerned, the market on March 1 was anywhere from $40 to $42, with a growing tendency to the $42 level as the prevailing basis. On the other hand, the leading interest, the United States Steel auxiliary, sold several lots of iron during the week and even toward the close at $38 in competition with the independents. One lot of 500 tons was booked. The leading interest has adhered strictly to the $38 base ever since it was established and has persistently sold at $38 during all of January and February. The total of its $38 bookings is considerable, and it is understood that the company feels able to continue booking to a certain extent in spite of the present limited production of one furnace. The flatfooted and open announcement of this continuous policy of conservatism in price is in striking contrast with the higher levels of the independents. Some of the independents are rather glad than not because it has a steadying effect, while others say they think the leading interest should play a hands off game in a market to which it caters to a limited extent owing to its small foundry production. Such business as the company feels its way to accept will continue to be booked at $38, while the rest will go at $40 to $42, and the $42 level, it is indicated, may become shortly the prevailing one.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

Foundry, silicon 1.75 to 2.25	$40.00 to $42.00
Basic	38.00 to 39.00
Charcoal	55.00

Cast Iron Pipe.—The cast iron pipe activity assumes larger proportions almost continuously. W. H. Rudisiall and others contemplate a new soil pipe shop at Anniston and a new one in Birmingham is projected. Frederic, Okla., has ordered 500 tons of water pipe. Monroe, La., will probably divide its 2000 ton order between two Birmingham interests. Oil well operators clamor for flange pipe. Additional flange pipe manufacturing equipment is to be installed to meet an extraordinary demand.

Coal and Coke.—Car shortage is seriously affecting coal and coke production as well as iron manufacture and shipments. The mine output has fallen from 370,000 to 320,000 tons of coal per week.

Old Material.—The scrap market suffers from embargoes and car shortage. Movements are greatly hampered. Stocks are about normal. Heavy steel is weak, but No. 1 cast is up and strong.

We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$21.00 to $21.50
No. 1 heavy steel	20.00 to 20.50
Cast iron borings	11.00 to 11.50
Machine-shop turnings	11.00 to 11.50
Stove plate	24.00 to 24.50
No. 1 cast	31.00 to 32.00
Car wheels	30.00 to 31.00
Tramcar wheels	28.00 to 29.00
Steel axles	29.00 to 30.00
No. 1 wrought	21.00 to 21.50

New York

New York, March 2.

Pig Iron.—The market continues strong and with a fair degree of activity, the most encouraging feature being the buying for early delivery by foundrymen who thought they had fully covered for their requirements up to July 1. The principal buying has been by railroad equipment companies. A valve manufacturer which was reported in the market last week has purchased about 1500 tons. Prices are firm and unchanged. The principal feature of the situation as to operations is the scarcity of coke, due to poor railroad service. Coke has been shipped surprisingly long distances, entailing freight charges that were very heavy, and the fact that foundries are willing to pay such high prices indicates very strongly how urgent their need is. It is earnestly hoped by coke consumers that Government control of coke distribution and prices will soon be ended.

We quote for delivery in New York as follows:

No. 1 foundry, sil. 2.75 to 3.25	$47.05 to $48.05
No. 2 X, sil. 2.25 to 2.75	46.05 to 47.05
No. 2 plain, sil. 1.75 to 2.25	44.80 to 45.80
No. 2 X, Virginia, sil. 2.25 to 2.75	46.40

Ferroalloys.—There is very little change in the ferromanganese market which, if anything, is stronger.

Supplies for prompt and early delivery are exceedingly scarce and sales of small lots have been made not only for prompt but for early second quarter delivery up to $200 to $225, delivered. As high as $250 was asked in one instance. An exceedingly limited amount of British alloy is available for approximately May-June delivery and for this about $200, seaboard, is the lowest quotation heard of. For delivery from August on a limited amount is obtainable at $165, seaboard. Domestic producers are asking $170 for third quarter and $160 for last half, at which price a little business is reported. There is some possibility that the present transportation and coke situation may interfere with any much needed inquiries in domestic production. The February output, according to blast furnace reports of THE IRON AGE was about 16,200 tons. Spiegeleisen, 19 to 21 per cent, is strong but quiet at $57 to $60, furnace, the latter quotation applying to nearby delivery. A large producer is out of the market for early delivery. Production in February was about 11,700 tons. Ferrosilicon, 50 per cent, is quoted at $80 to $85 per ton, delivered, with demand moderate. Quotations for ferrotungsten are 80c. to 85c. per lb. of contained tungsten. Ferrochromium, 60 to 70 per cent, carload lots, is quoted at around 18c. to 19c. per lb. of contained chromium, with the carbon ranging from 6 to 8 per cent. For less than carload lots 1c. per lb. higher is asked, and for the alloy in which the carbon ranges from 4 to 6 per cent an increase of about 1c. per lb. over the foregoing values is the rule. Ferrovanadium is quoted at $5.50 to $6 per lb. of contained vanadium in wholesale lots for early delivery. Ferrocarbontitanium, 15 to 18 per cent, is selling at $200 per net ton in carload lots, at $220 per ton in lots between one ton and a carload, and at $250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—How extensive railroad purchases will be depends in part on the financing factor. It appears that car repair orders will first be conspicuous. The Pennsylvania Railroad last week let orders for the repair of 2000 freight cars to three or four car builders, and it is stated that the New York, New Haven & Hartford has at least 50,000 cars in urgent need of heavy repairs. The American Locomotive Co. has taken 55 locomotives for the Canadian National Railroad, these to be built at its Montreal works; 20 from the Boston & Maine and 37 of the 102 recently placed by the Union Pacific. Purchases by Eastern roads include track bolts, spikes, steel castings, bolts, nuts and rivets. There is little improvement in production and shipments, but an easier tone is expected with warmer weather. With consuming industries handicapped by car blockades, demand for steel has naturally fallen off. Some buyers indeed feel that the prices lately quoted by some of the mills will not continue for long. This attitude is now reflected also in cables from Japan; offers of 500 tons of steel bars at 3.25c. and 500 tons of plates at 3.50c., Pittsburgh, have been turned down by Japanese buyers, who claim they will obtain lower prices. There is no note of weakness in prices at present. Whenever material is offered for reasonably early delivery the maximum quotations usually result in business. An exporter who came into the market for 5000 tons of plates for a European shipyard has placed at least a part of the requirements at 4c., Pittsburgh, and 5000 tons of tank quality plates have been sold to railroads and car builders at the same price. An Eastern railroad, however, bought a part of its needs from a Pittsburgh mill at 3.50c., though paying 4c. for the remainder. A few desirable tonnages have been placed at 3.75c., Pittsburgh, when offers were made by the buyers. Steel bars are practically unobtainable in less than three to four months, and 4c., Pittsburgh, is generally quoted by those mills able and willing to guarantee that delivery. For earlier delivery 4.50c., Pittsburgh, is obtainable. Inability of fabricators to obtain satisfactory deliveries on structural shapes is holding up considerable prospective construction work. The American Bridge Co. will fabricate 5600 tons for a church and office building at Madison Avenue and Forty-third Street, New York, and 3000 tons for a building for the National Biscuit Co. in Chicago. The Lackawanna Bridge Co. has taken 900 tons for a plant for the Atmospheric Nitrogen Corporation, Syracuse, N. Y. The McClintic-Marshall Co. has taken 250 tons for a building for the Phoenix Utilities Co., Hauto, Pa. Two other jobs let are 725 tons for additions to the Worth Steel Co. plant at Claymont, Del., and 400 tons for a foundry for the Chambersburg Engineering Co., Chambersburg, Pa.

We quote for mill shipment, New York, as follows: Soft steel bars 2.62c. to 4.77c.; shapes, 2.72c. to 4.27c.; plates, 2.92c. to 4.27c., the minimum prices being for indefinite delivery and the higher prices for the second quarter; bar iron, flats, wider than 6 in., 4.07c.; ⅜ and 7/16 in., round and square, 4.47c.; light rounds, squares and flats, 4.77c., and other sizes, 3.77c.

Warehouse Business.—Jobbers are still limited largely by ice-bound side streets to about one-third normal truck delivery. Warehouses carrying general lines note as a consequence a slight check to both inquiry and orders. The continued depletion of jobbing stocks, liberally estimated at less than 25 per cent normal, is a substantial contributing factor. Houses dealing more in special lines, however, do not note any constriction of current business. With stocks low, jobbers show an increasing tendency to cater to their established trade. Rail shipments still dribble in in small tonnages, although the only embargo incoming is on Central Railroad of New Jersey shipments, others having been raised last Thursday. Consignments into New England are embargoed via the New Haven railroad. The chief trouble with traffic out of town, either in or out by water, is due to notorious soldiering by pier workers. Improvement in the trade waits for a spell of warm weather to release both rail and truck traffic. Prices out-of-store, quoted on page 724, are largely nominal, transactions depending entirely on whether or not the material wanted is on hand.

Old Material.—There is very little change in the market compared with a week ago, except in the case of cast scrap, on which prices have raised from $1 to $2 because of the ever-growing scarcity. One prominent New York broker tells of a fairly large volume of business last week, but admits the tone of the market as a whole is weak and lacks a normal healthy condition. Attention is again called to shipments to Pittsburgh after a period of inactivity when the Jones & Laughlin Steel Co. ordered a large tonnage at the reported price of $29 for heavy melting steel. Machine shop turnings have dropped a trifle, as the leading consumer, located at Harrisburg, has curtailed orders because of damage to its plant by fire and its lack of fuel. Stove plate and grate bars are up $1, $33 having been paid delivered to Mahwah, N. J.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$21.00 to $22.00
Rerolling rails	30.00 to 31.00
Relaying rails, nominal	48.00 to 50.00
Steel car axles	34.00 to 35.00
Iron car axles	43.50 to 44.00
No. 1 railroad wrought	33.00 to 34.00
Wrought iron track	24.50 to 25.00
Forge fire	18.00 to 18.50
No. 1 yard wrought, long	26.00 to 26.50
Light iron	10.00 to 11.00
Cast borings (clean)	19.50 to 20.00
Machine-shop turnings	16.50 to 17.00
Mixed borings and turnings	16.00 to 16.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	21.50 to 22.00
Stove plate	29.50 to 30.00
Locomotive grate bars	29.50 to 30.00
Malleable cast (railroad)	29.00 to 30.00
Old car wheels	39.00 to 40.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$42.00 to $43.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	40.00 to 41.00
No. 1 heavy cast, not cupola size	31.00 to 32.00
No. 2 cast (radiators, cast boilers, etc.)	32.00 to 33.00

Cast-Iron Pipe.—Eastern pipe manufacturers are being asked to quote on Western business, thus indicating the difficulty of securing these products in the West. One of these inquiries is that of the city of Saginaw, Mich., for 1700 tons of 6, 8 and 12-in. pipe, to be awarded March 9. Inquiries have increased the past week, while inability to satisfy them has been intensified by the bad weather conditions, the embargoes into New England, which is an important market in this

vicinity, and by sickness among workmen. On the demand for 1800 tons of pipe, 8 to 24 in., for the city of Boston, R. D. Wood & Co., Philadelphia, were low bidders. We quote 6-in. and heavier at $70.30, New York; 4-in., $73.30, with $2 additional for Class A and gas pipe.

Philadelphia

PHILADELPHIA, March 2.

There is an improvement in car supply, which is reflected in larger receipts of coal at eastern steel plants and shipments of steel are going forward in greater volume. If the railroad service continues to improve, the steel industry in this section will soon be working at full, or nearly full, production.

The steel companies are counting on a great deal of business from the railroads, but not much inquiry has come out in the past week. Some of the eastern railroads anticipated the return of the roads to private operation and bought steel for urgent car repairs. The purchase by the Baltimore & Ohio of 5000 tons of plates was reported last week. The Pennsylvania Railroad followed with orders estimated at about 7500 tons of plates, 1500 tons or more of shapes and 1000 tons or more of bars. The Western Maryland bought 1000 tons of plates, and its needs are so urgent that it persuaded a steel company to begin deliveries immediately. A part of the Pennsylvania's plate requirements will be filled by a Pittsburgh mill at 3.50c., but deliveries will be several months off. Other plate makers obtained 4c., Pittsburgh, but were able to promise earlier delivery.

Inquiry for steel from industrial concerns has fallen off considerably, though a good volume of business can be done by the few companies which can promise fairly satisfactory deliveries. Plates are now obtainable from one mill in a few weeks, large size bars can be had in six to eight weeks and shapes in the same time or possibly less, but as a rule this company is reserving tonnage only for its regular customers.

Pig Iron.—Without the stimulus of excited buying such as prevailed 30 to 60 days ago, the tendency of pig iron prices, particularly on foundry grades, is toward higher levels. One eastern furnace interest has advanced its prices for second half to the basis of $45, furnace, that applying on iron 1.75 to 2.25 per cent silicon, with usual differentials for higher percentages of silicon. Another eastern interest is expected to name the same price for second half. The past week has been quiet, much of the demand being for second half, but no large amount of business has been negotiated. For prompt delivery, iron is available at $42 to $44, base, furnace, with usual differentials. The minimum price is quoted by furnaces having the highest freight rate to the Philadelphia district. No sales of basic iron are reported. One eastern interest, which was figuring on covering its basic requirements for third quarter, has withdrawn its tentative inquiry, evidencing some doubt as to whether steel prices in the last half will be high enough to justify the purchase of iron at $41, furnace, the price which most producers are said to have quoted. Malleable iron is scarce and high prices are being paid. An eastern consumer who came into the market recently was unable to get a quotation. A railroad company recently closed for a tonnage at $45, Hanging Rock furnace. An eastern steel company has some low phosphorus basic iron, suitable as a substitute for malleable, which it offers at $43 to $44, furnace. A sale of 500 tons of gray forge iron at $41, furnace, with a $2 freight rate was made last week. Some trouble is still being experienced by furnaces in getting adequate coke supplies, but it is believed an improvement will soon be in evidence.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinty, except those for low phosphorus iron, which are f.o.b. furnace:

Eastern Pa., No. 2X, 2.25 to 2.75 sil.	$45.35 to $46.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	44.10 to 45.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	46.10
Virginia No. 2X, 2.25 to 2.75 sil.	47.35
Basic deliv. Eastern Pa.	43.40
Gray forge	43.00
Standard low phos. (f.o.b. furnace)	50.00
Malleable	46.00 to 50.00
Copper bearing low phos. (f.o.b. furnace)	47.00

Ferroalloys.—One maker of ferromanganese is naming a price of $175, delivered, for second half. Another leading producer still quotes $160, but not much business is being done at either figure. For spot supplies $200 to $225 has been obtained. Spiegeleisen is quoted at $52.50, furnace, but no important transactions are reported here.

Plates.—The Pennsylvania Railroad last week closed for about 7500 tons of plates. A Pittsburgh mill will furnish a part of the tonnage at 3.50c., Pittsburgh, with delivery several months off, and Eastern companies obtained 4c., Pittsburgh, being able to give earlier delivery. The Western Maryland bought 1000 tons of plates from an Eastern company, and deliveries will be begun this week, as the road's rolling stock is in urgent need of repairs. There is a disposition on the part of the steel companies to give preference to railroad business. Considerable business in plates is expected. One estimate is that at least 100,000 freight cars will be ordered by the railroads within the next few months, requiring upwards of 1,000,000 tons of steel, mostly plates. One eastern mill, which is now getting good production, is promising deliveries of plates ½ in. and heavier within a few weeks, and is booking considerable business, but mostly from regular customers. We quote sheared plates, ¼-in. and heavier, at 3.75c. to 4.25c., Philadelphia.

Structural Material.—Local fabricators are figuring on a bank building to be built in New Orleans, requiring about 4000 tons. Demand for shapes continues active, one mill last week receiving inquiries totaling more than double its monthly output. Only one company in the East, so far as reported, is taking business for second quarter specification, but others are being urged by fabricators and jobbers to open their books. We quote plain material at 3.75c. to 4.25c., Philadelphia.

Bars.—An Eastern company, which has opened its books for bar contracts for second quarter, has taken a deal of business at 4c., Pittsburgh. Jobbers to whom tonnage was offered accepted without quibbling over the high price. Agricultural implement manufacturers have also signed contracts, apparently glad to be covered without regard to price. Bar iron mills are taking a goodly amount of business from jobbers, who ordinarily carry only steel bars in stock in the sizes specified. These sales are being made at 4c., base, by nearly all of the bar iron mills. The Pennsylvania Railroad placed 1000 tons or more of steel bars for car repairs and is understood to have paid 4c., Pittsburgh.

Rails.—The Cambria plant at Johnstown in February rolled about 17,000 tons of heavy rails for the railroads, this amount applying on the 26,000 tons, for which a commandeering order was issued by the Railroad Administration and the War Department. No new inquiry of size for standard rails has come from the railroads, but the Pennsylvania Railroad has given specifications, it is reported, to the leading interest for a large quantity, probably close to 100,000 tons. This is a part of the 200,000 tons for which the Pennsylvania came into the market two or three months ago. The leading interest quoted $47 on open-hearth rails, but the independents quoted $57, and have not received specifications, though two of them reserved tonnage. One company now quotes $60 on Bessemer rails and $62 on open-hearth, and has made sales of a few small lots at these prices.

Old Material.—While the market as a whole is quiet, with prices almost stationary, a slightly stronger tendency is noted in heavy melting steel. Pittsburgh dealers have offered $27.50 and $28, delivered Pittsburgh, for heavy steel to apply on orders received from a Pittsburgh steel company at $29. A Delaware steel plant has paid $25.50, delivered, and higher prices have been paid by consumers at Trenton, Rahway and Newark, N. J. An Eastern steel company paid $26.76, delivered, to one of its shipyard customers for 400 tons of plate and shape croppings. A significant inquiry comes from a company which specializes in railroad forgings for 12,000 tons of low phosphorus melting

stock. Owing to embargoes at some consuming points in eastern Pennsylvania cast borings and machine shop turnings are off about $1 a ton. We quote for delivery at consumers' works, eastern Pennsylvania, as follows:

No. 1 heavy melting steel	$25.50 to $26.50
Steel rails rerolling	35.00 to 36.00
No 1 low phos,, heavy, 0.04 and under	32.00 to 33.00
Car wheels	42.50 to 45.00
No. 1 railroad wrought	36.50 to 37.50
No. 1 yard wrought	30.00 to 32.00
No. 1 forge fire	21.00 to 22.00
Bundled skeleton	21.00 to 22.00
No. 1 busheling	24.00 to 25.00
No. 2 busheling	18.50 to 19.50
Turnings (short shoveling grade for blast furnace use)	19.00 to 20.00
Mixed borings and turnings (for blast furnace use)	19.00 to 20.00
Machine-shop turnings (for rolling mill and steel works use)	21.00 to 22.00
Heavy axle turnings (or equivalent)	23.00 to 24.00
Cast borings (for rolling mills)	23.00 to 24.00
Cast borings (for chemical plant)	28.00 to 30.00
No. 1 cast	40.00 to 41.00
Railroad grate bars	32.00 to 33.00
Stove plate	30.00 to 31.00
Railroad malleable	30.00 to 31.00
Wrought iron and soft steel pipes and tubes (new specifications)	25.00 to 26.00
Iron car axles	45.00 to 46.00
Steel car axles (f.a.s. New York for export)	39.00 to 40.00

Buffalo

BUFFALO, March 1.

Pig Iron.—Furnaces here have been caught by the car shortage which has inconvenienced the mills for so long. At least two furnaces have been compelled to pile iron and one reports that it has piled 20,000 tons. A better delivery of cars is noticeable now, but there is room for considerable improvement. Meanwhile, consumers are very anxious to obtain shipment on contracts. Between 8000 and 10,000 tons of foundry iron was sold in this district last week, it is estimated. The price for this was as follows: 1.75-2.25 silicon content, $45; 2.25-2.75 silicon content, $46.25 and 2.75-3.25 silicon content, $48. One furnace sold 3000 to 4000 tons. Another sold 3000 tons, a fourth sold about 1000 tons. There was a smaller tonnage of malleable iron sold at $46.25. Other sales, it is believed, will increase the total amount of tonnage somewhat. Foundries seem now to be well covered for the rest of the year, and furnaces are not pressing for business.

No. 1 foundry, 2.75 to 3.25 silicon	$48.00
No. 2 X foundry, 2.25 to 2.75 silicon	46.25
No. 2 plain, 1.75 to 2.25 silicon	45.00
Basic	44.00
Malleable	46.25
Lake Superior charcoal	$58.00 to 60.00

Finished Material.—The demand keeps up for all classes of finished material, with very little selling. Occasionally a mill has a little tonnage it can take on, but these are isolated occurrences. Sales are very restricted. The car situation is a trifle improved, but it is still very far from normal. Mills report that some departments have piled material close to maximum capacity, and are hard pushed to dispose of it now. Wire and nail mills are sold up for an extended period ahead and will not be in the market for at least two months. Billet mills report the same conditions. Prices continue to be represented by a wide spread between independent mills and those of the Corporation. The John W. Cowper Construction Co. has taken the general contract for an addition to the plant of the National Carbon Co., Niagara Falls, N. Y. About 300 tons of structural material will go into this contract, all of which will be supplied by the Kellogg Structural Steel Co., Buffalo.

Old Material.—Dealers here believe that a real buying movement is now in sight. It is stated on reliable authority that 40,000 tons of heavy melting steel has just been sold in the Pittsburgh district. Twenty thousand tons was sold for $29 and 20,000 tons for $29.50. Dealers believe that this movement may result in a strong buying movement developing in the local district, as it is said that mill stocks need replenishing. Dealers report that the car situation is considerably improved. After being hampered for weeks by lack of cars, these are now being sent in, loaded with shipments which were held up because of severe weather. Mills, too, report slightly better delivery.

We quote dealers' asking prices, per gross ton f.o.b., Buffalo, as follows:

Heavy melting steel, regular grades	$26.50 to $27.50
Low phos., 0.04 and under	32.00 to 33.00
No. 1 railroad wrought	31.00 to 32.00
No. 1 machinery cast	38.00 to 39.00
Iron axles	40.00
Steel axles	40.00
Car wheels	37.00 to 38.00
Railroad malleable	31.00 to 32.00
Machine-shop turnings	17.50 to 18.00
Heavy axle turnings	21.00 to 22.00
Clean cast borings	20.00 to 21.00
Iron rail	30.00 to 31.00
Locomotive grate bars	24.00 to 25.00
Stove plate	30.00 to 31.00
Wrought pipe	20.00 to 21.00
No. 1 busheling	22.00 to 23.00
Bundled sheet stamping	19.00 to 20.00

Cleveland

CLEVELAND, March 2.

Pig Iron.—The market has become very quiet, following the recent heavy buying movement for the last half. Sales during the week include 4500 tons of basic iron for prompt shipment, taken at $43, and divided between two Valley and a western Pennsylvania furnace, 2000 tons of high silicon iron for prompt shipment placed with a Cleveland furnace for shipment to Chicago, two 1000-ton lots of foundry iron for the last half, one placed in Marion, Ohio, and the other by an Indianapolis melter, and 800 tons placed with a Valley furnace by a Pittsburgh district consumer. One interest reports sales during the week which aggregate 7000 tons. Sales of high silicon foundry iron, which is exceedingly scarce for prompt shipment, are reported at $45 for early delivery, but some resale of foundry iron low in silicon is being offered at $43.50 for prompt shipment. For the last half delivery, $42 is still most generally being quoted for 1.75 to 2.25 silicon iron, but some sales are being made at $43. Nearly all consumers in the foundry trade in this territory have purchased iron for the last half, but many have been unable to secure all the iron they will need and are expected to come in the market again later. Furnaces in this territory are said to be sold up to about 80 per cent of capacity for that delivery. Southern foundry iron is quoted at $42 for 1.75 to 2.25 silicon. The shortage in silvery iron for early shipment continues acute and some resale silvery iron has been absorbed at $58, or $3 a ton above the regular price. Consumers are crowding furnaces for shipment and producers in this territory are barely able to get sufficient cars to move their output. They find it practically impossible to secure cars to move shipments from stock that, in some cases, are badly wanted by consumers.

We quote delivered Cleveland as follows:

Basic	$41.40 to $43.40
Northern No. 2 foundry, sil. 1.75 to 2.25	42.40 to 43.40
Southern foundry, sil. 2.25 to 2.75	48.25 to 48.70
Gray forge	41.40
Ohio silvery, sil. 8 per cent	58.40
Standard low phos., Valley furnace	48.00 to 49.00

Iron Ore.—Ore sales were very light during the week. However, two or three round lots are pending. Most consumers have bought, but many have not covered for their full season's requirements. Shipping orders have improved and dock shipments have so far been slow because the ore has been difficult to handle on account of being frozen.

We quote, delivered, lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Finished Iron and Steel.—The return of the railroads to their owners has already resulted in considerable inquiry from railroads for steel for car and locomotive repairs and mills are endeavoring to give this business preference in order that transportation facilities may be improved. Locally, work will be started shortly in connection with the new union passenger station and terminals which, according to the engineers' estimates, will require 4000 or 5000 tons of steel this year, largely in rails. The Ann Arbor road is inquiring for 3000 tons of rails and mills are being urged to make early deliveries on rails previously

placed. The Lackawanna Steel Co. has taken 1700 tons of open-hearth rails at $57 for industrial plants. Detroit automobile manufacturers are apparently harder pressed than ever for sheets, particularly for full finished sheets, and are scouring the country to find mills that will take additional orders. One inquiry is for 5000 tons of finished and 1000 tons of black sheets, and another manufacturer is trying to buy a round tonnage of sheet bars to convert into sheets for bodies and deep stamping work. A Valley mill which booked sheet orders subject to prices prevailing at time of shipment is making March shipments at 6c. for black and 5c. for blue annealed sheets. A local mill is selling black sheets at 7.50c. and blue annealed at 6c. for early shipment, but quotations as high as 8c. for black and 7.50c. for blue annealed are being made. Plates for early shipment are quoted at 4c., but sales of ⅜-in. plates have been made on the blue annealed basis or equivalent to a 4.60c. plate basis. We note the sale of 1000 tons of plain bolt wire for early delivery at 3.75c. or a $5 per ton advance. Structural material and soft steel bars are quoted at 4c. for early shipment and this is now the well established price for hard steel bars. In structural work the McClintic-Marshall Co. has taken 2500 tons for the new open-hearth plant of the Mansfield Sheet & Tin Plate Co., Mansfield, Ohio.

Coke.—The coke situation has grown worse the past week. Many foundries are curtailing production because of lack of fuel. There is a good demand for by-product coke, as many foundries are piecing out with by-product coke, which is quoted at $12.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is very heavy, and more business is being offered to manufacturers than they are able to take care of. This is particularly true of small sizes, ranging from 7/16 in. down, made from wire stock on which makers are several months behind on deliveries. This situation has resulted from the difficulty in securing wire stock. Bolt manufacturers expect a marked increase in demand from the railroads now that they have been restored to private ownership, and will do their best to give the railroad orders preference in order that the transportation situation may be improved. The demand for rivets is heavy, being mostly in the form of specifications on contracts. Prices on bolts, nuts and rivets are firm.

Old Material.—The scrap market continues dull and weak. Activity during the week was confined almost wholly to trading between dealers and there is not much of this, as the trade is well covered on old orders. The reported round lot purchase of heavy melting steel by a Pittsburgh mill has caused a little better feeling in the trade and the return of the railroads to their owners is expected to have a good effect in that the railroads will place equipment. In particular there is expected stimulation in the demand for low phosphorus scrap for use in steel foundries doing railroad work. Heavy melting steel is being offered under $27 for Valley delivery. However, we note the sale of 2500 tons to a local dealer at $27 to $27.25, delivered Valley mill, to cover old contract. Cast scrap has declined to $1 a ton from its recent high level and borings and turnings are slightly lower.

We quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$25.75 to $26.00
Steel rails, under 3 ft.	29.00 to 30.00
Steel rails, rerolling	33.75 to 34.50
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. melting scrap	30.00 to 31.00
Cast borings	18.25 to 18.50
Iron and steel turnings and drillings	15.25 to 15.75
Short turnings for blast furnaces	18.00 to 18.50
Compressed steel	22.50 to 23.00
Railroad wrought	29.00 to 30.00
Railroad malleable	32.00 to 32.50
Agricultural malleable	27.00 to 28.00
Steel axle turnings	22.50 to 23.00
Light bundled sheet scrap	18.00 to 18.50
No. 1 cast	39.00 to 40.00
No. 1 busheling	22.00 to 22.50
Drop forge flashings, over 10 in.	19.00 to 19.50
Railroad grate bars	30.00 to 31.00
Stove plate	30.00 to 31.00

Cincinnati

CINCINNATI, March 1.

Pig Iron.—The past week was a very dull one in the pig iron market, business being confined to small lots. Inquiry is light, the principal ones before the market being for 5000 tons of basic from a nearby rolling mill and 3000 tons of foundry, 2000 tons of which is Southern and 1000 tons Northern, from a large machine tool manufacturer. This business is expected to be closed within the next few days. Prices cover a wide range, but most of the business is being placed at last week's figures. Southern iron is still being offered by at least two furnaces in limited quantities at the $40 base price, while others are quoting as high as $44.50. One large interest, which was temporarily out of the market, is reported to be willing to book for second half at $42. Another reported that it had disposed of an aggregate of about 5000 tons for both first and second half delivery at $42. Southern Ohio iron is being quoted at $45 for the second half by one interest, which reports sales at that figure. A sale of a small lot of southern Ohio iron was reported during the week at $42 Ironton, but this cannot be confirmed. Virginia iron is firm at $42, furnace. Sales of basic and malleable were confined to small lots. There is a scarcity of Jackson County silver, and one Cleveland melter recently paid a premium of $3 per ton for three cars of 7 per cent.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$43.60 to $45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	44.85 to 46.85
Ohio silvery, 8 per cent sil.	56.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	44.80 to 46.80
Basic, Northern	41.80
Malleable	43.80 to 45.80

Coke.—The coke situation shows no improvement. A representative of a large house in this city who recently visited the New River district reports that there is a good supply of coke, but no cars to move it. Coal mines in this district are being handicapped by an epidemic of influenza, a number of them being closed down on this account. To illustrate the scarcity of coke, a firm here reports that last week it sold five cars of New England coke to a foundryman in this district, which cost the latter, including a freight rate of $7.70, $19.25 delivered. This is the first time in its recollection that New England coke has been sold here.

Finished Material.—Deliveries of finished materials are becoming, if anything, a little worse than they had been. While mills are endeavoring by all means in their power to increase production, they are finding great difficulty in securing efficient labor. A representative of one of the leading wire and nail companies who was here this week stated that while production was improving, it was a slow process, and it would be some time before normal conditions were restored. He urged all dealers to anticipate their requirements as far as possible, and warned them against the danger of speculation. Local warehouses have given up quoting to their customers, as they are being supplied with steel products from the mills at prices ruling on day of shipment, and they find it impossible to make prices. Sheet mills in this vicinity are running at about 85 per cent of their capacity, and are taking on only small tonnages for their regular customers. There appears to be a fair tonnage of sheets in the hands of brokers, and sheet metal workers are getting a large part of their supply from these sources. One jobber reported that he was offered sheets at 8.40c. for black and 9.50c. for galvanized, No. 28 gage. This appears to be the price at which local roofers are being supplied from brokers' stocks. Warehouses generally quote the same grades at from 5c. to 5.50c. for black, and 6.75c. to 7c. for galvanized, and these are the prices at which their customers are being supplied when they are fortunate enough to secure a shipment. The shortage of reinforcing bars is holding up a number of buildings now in course of construction, and if it continues will seriously interfere with the building program scheduled for this spring. A local warehouse, as illustrating the scarcity of all finished materials, re-

ports that while it is customary for it to carry about $80,000 worth of pipe, it has now in stock only about $2,000 worth. Improvement is looked for now that the railroads are back under private ownership.

Old Material.—The scrap market is a little more active than last week. Prices remain firm generally, though a number of items have been advanced, among them being relaying rails, up $3, burnt scrap, up $2, and cast scrap, up $1. Cast scrap is scarce, and dealers are predicting higher prices in the future. Cast borings and steel turnings are not in great demand. A Chicago dealer is offering borings in this territory, but up to date has not disposed of any. Foundries generally are rushed with business. A large machine tool manufacturer has been forced to go as far at St. Louis to secure castings, he having placed an order for 900 tons with a foundry in that city.

	Per Gross Ton	
Bundled sheet	$16.00	to $17.00
Old iron rails	27.00	to 28.00
Relaying rails, 50 lb. and up	46.00	to 47.00
Rerolling steel rails	30.00	to 31.00
Heavy melting steel	22.00	to 23.00
Steel rails for melting	24.00	to 25.00
Car wheels	29.00	to 30.00
No. 1 railroad wrought	26.00	to 27.00
	Per Net Ton	
Cast borings	$13.50	to $14.00
Steel turnings	12.00	to 12.50
Railroad cast	31.00	to 32.00
Machinery	34.00	to 35.00
Burnt scrap	22.00	to 23.00
Axles	29.50	to 30.00
Locomotive tires (smooth inside)	23.50	to 24.50
Pipes and flues	17.00	to 17.50
Malleable cast	23.00	to 23.50
Railroad tank and sheet	16.00	to 16.50

St. Louis

ST. LOUIS, March 1.

Pig Iron.—The disposition of the melting interests continues to be toward buying in lots ranging around 500 tons, some above and some below that figure, for shipment through the last half principally. The furnaces have not been able to meet some of the inquiries, or have not been disposed to, and this has resulted in efforts being made to get pig iron from other centers. The aggregate of inquiry, while not of extremely large magnitude, is still of sufficient interest to the trade to attract attenion. The quotations are still about as reported last from this market.

Coke.—The coke situation continues to be a matter of deliveries, and chiefly upon existing contracts, the car conditions being very bad, with the result that melters are not getting the fuel that they need.

Finished Iron and Steel.—In finished products the demand is still far above the available supply, and stocks in warehouse and elsewhere are in such condition that the consumers are having a hard time of it in keeping up their operations. A very considerable proportion of the present trouble is reported to be due to the car shortage rather than to the mill output, but this does not relieve buyers' minds. Better weather conditions are hoped for as an aid to relief in the situation. Mill representatives are still side-stepping orders, and while they accept specifications on contracts, they do not show any enthusiasm as to the prospects of delivery. Jobbers are doing the best they can, but that best is not improving very much.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.59c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 5.59c.; No. 28 black sheets, cold rolled, one pass, 6.60c.; No. 28 galvanized black sheet gage, 8.10c.

Old Material.—The scrap market is generally awaiting developments although in an optimistic frame of mind and disinclined to make sales at present or lower prices. The improvement looked for is expected to come from the return of the railroads to private ownership, although it may not come for some little time due to the necessity for getting settled down again. No lists are out as yet for this month because of the confusion incident to the transfer of the roads, but they are expected within a short time.

We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$32.50	to 33.00
Old steel rails, rerolling	32.50	to 33.00
Old stel rails, less than 3 ft	28.00	to 28.50
Relaying rails, standard sections, subject to inspection	45.00	to 50.00
Old car wheels	33.50	to 34.00
No. 1 railroad heavy melting steel	24.50	to 25.00
Heavy shoveling steel	22.50	to 23.00
Ordinary shoveling steel	21.50	to 22.00
Frogs, switches and guards, cut apart	26.00	to 26.50
Ordinary bundled sheets	16.00	to 16.50
	Per Net Ton	
Heavy axle and tire turnings	19.00	to 19.50
Iron angle bars	28.00	to 28.50
Steel angle bars	23.00	to 23.50
Iron car axles	37.00	to 37.50
Steel car axles	33.00	to 33.50
Wrought arch bars and transoms	31.00	to 31.50
No. 1 railroad wrought	25.50	to 26.00
No. 2 railroad wrought	23.50	to 24.00
Railroad springs	23.00	to 23.50
Steel couplers and knuckles	24.00	to 24.50
Locomotive tires, 42 in. and over, smooth inside	25.00	to 25.50
No. 1 dealers' forge	23.00	to 23.50
Cast iron borings	15.00	to 15.50
No. 1 busheling	22.00	to 22.50
No. 1 boiler, cut to sheets and rings	18.50	to 19.00
No. 1 railroad cast	35.50	to 36.00
Stove plate and light cast	30.50	to 31.00
Railroad malleable	26.50	to 27.00
Agricultural malleable	26.00	to 26.50
Pipes and flues	20.50	to 21.00
Heavy railroad sheet and tank	20.00	to 20.50
Railroad grate bars	29.50	to 30.00
Machine-shop turnings	15.50	to 16.00
Country mixed	22.50	to 23.00
Uncut railroad mixed	23.50	to 24.00
Horseshoes	24.00	to 24.50

Welsh Steel Workers Strike

Lack of Fuel and Raw Materials—Tin Plate Workers Demand Six-Hour Shift

(By Cable)

LONDON, ENGLAND, March 1.

A chronic lack of fuel and raw materials prevents expansion in pig iron output and present conditions threaten to continue indefinitely. The steel position is unrelieved and the car situation is worse. Works are unwilling sellers at any price. Crown iron bars have sold for export at £26 10s.

The majority of the Welsh steel workers are on strike owing to a refusal to grant a 40 per cent advance in wages.

The tin plate industry is also seriously threatened owing to the cutting off of supplies of bars. The tin plate market is firmer and a new buying movement for domestic and export consumption has appeared, but it is impossible to fill orders and an acute shortage is regarded as inevitable. Quotations stand at 73s. 6d., basis, for prompt delivery and at 71s. for second half, but there are few sellers. Workers are demanding 6-hr. shifts and labor is already insufficient. If new demands are enforced the present output will be reduced 20 to 25 per cent. About 40,000 boxes of American tin plate are believed to have been sold to plants, mostly odd sizes.

The galvanized sheet market is very strong, No. 23 gage having been sold for June-July delivery at £53 10s. Prices for thin gages are soaring and there is a large demand from Japan for flats, with £77 being asked for November shipment.

We quote per gross ton, except when otherwise stated, f.o.b. makers' works, with American equivalent figured at $3.44 for £1, as follows:

	£	s.	d.	£	s.	d.	
Ship plates	23	10	0	to 26	10	0	$80.84 to $91.16
Boiler plates	27	10	0	to 30	0	0	94.60 to 103.20
Tees	21	10	0	to 27	0	0	73.96 to 92.88
Channels	20	15	0	to 26	5	0	71.38 to 90.30
Beams	20	10	0	to 25	0	0	70.52 to 86.00
Round bars, ¾ to 3 in.	23	0	0	to 27	10	0	79.12 to 94.60
Rails, 60 lb. and up	19	15	0	to 20	5	0	67.94 to 69.66
Billets	23	0					79.12
Steel hoops	31	15	0	to 32	0	0	109.22 to 110.08
Tin plates	0	71	0	to 0	73	6	12.21 to 12.64
Sheet and tin plate bars, Welsh	23	0	0	to 30	0	0	79.12 to 103.20
Galv. sheet, 24 g.	51	0	0	to 53	10	0	175.44 to 184.04
Cleveland basic iron	9	5	0				31.82
West Coast hematite	12	5	0				42.14
Cleveland No. 3 foundry (export)	11	10	0				39.56

The above prices are more or less nominal.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper New York		Tin.	Lead		Zinc	
Feb.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
25	19.25	19.00	64.00	9.25	9.00	9.35	9.00
26	19.12½	18.87½	61.50	9.25	9.00	9.25	8.90
27	19.00	18.87½	61.00	9.25	9.00	9.15	8.80
28	19.00	18.75	....	9.25	9.00	9.10	8.75
Mar.							
1	18.87½	18.75	62.25	9.25	9.00	9.05	8.70
2	18.75	18.75	63.25	9.25	9.00	9.10	8.75

NEW YORK, March 2.

Most of the markets are quiet and in some cases prices are easier. Demand for copper is extremely light; values have receded and are largely nominal. Buying of tin has been insignificant and quotations for spot metal have been largely influenced by the highly speculative London market. Supplies of lead are not equal to demand for early shipment and prices are stronger and higher. Inquiry for zinc has tapered off and prices have consequently fallen. Antimony is scarce and values are higher.

New York

Copper.—The market could hardly be duller. Most of the larger producers have reduced their quotations for early shipment but only a little business has resulted. Stocks are known to be fairly large and probably it is their desire to stimulate business. Electrolytic copper for early or March delivery is obtainable from first as well as second hands at around 18.75c., New York, with Lake copper at about the same level. These quotations are, however, largely nominal. It is the general feeling that a buying movement will appear in the next two or three weeks because the movement in December covered consumers' requirements largely for the first quarter, although some buying included delivery into the second quarter. There is very little interest on the part of export buyers, but the needs from this source are expected to develop in the near future. The trade is nevertheless confident that while some fairly cheap lots of copper may be available in the immediate future, the market will be stronger a little later.

Copper Averages.—The average price of Lake copper for the month of February, based on daily quotations in THE IRON AGE, was 19.25½c. The average price of electrolytic copper was 19.02c.

Tin.—The market has been quiet and buying by consumers has been very light. It has consisted almost entirely of purchases of small quantities of spot Straits metal. Most of the trading has been between dealers and even this has declined as the week has progressed. Spot tin to-day is quoted at 63.25c., New York, and in the week has fluctuated, due to the highly erratic and speculative market in London, where spot Straits and standard tin has fluctuated between £418 per ton a week ago down to nearly £400 late last week, from which level it has again advanced to £411 for spot Straits to-day. Under such conditions it is almost impossible for dealers and importers on this side to do any figuring and consequently any substantial business. There have been practically no transactions in future shipments. Deliveries of tin for the month of February were 5200 tons, of which only 300 was credited to Pacific ports, and the stocks and quantity on landing on Feb. 29 was 3743 tons. Imports for the first two months of 1920 have been 9415 tons, as compared with 4366 tons for the same two months in 1919. The quantity afloat yesterday is reported as 3195 tons.

Lead.—This market is quiet but exceedingly strong. It is almost impossible to do business because supplies of the metal do not exist for prompt and early delivery. Practically all the producers have no metal for prompt shipment, only a little being available for the latter half of March and a small quantity for April shipment. Under the circumstances consumers do not appear to be anxious to buy for future delivery, considering the market too high and are therefore only attempting to buy from hand to mouth. Quotations are largely nominal at 9c., St. Louis, or 9.25c., New York, with as high as 9.30c. and 9.37½c., New York, reported in some quarters. Export inquiry is exceedingly good and there is some danger that this may drive prices higher, at least temporarily. Some dealers, however, are still bearish on the ultimate situation. The leading interest's quotation is 9c., New York, and 8.75c., St. Louis.

Zinc.—Inquiry both for domestic and foreign consumption has tapered off and as a consequence quotations have declined. Prime Western for any delivery up to July 1 is quoted at 8.75c., St. Louis, or 9.10c., New York. A little business for nearby delivery for domestic account has been done, some of it yesterday as low as 8.70c., St. Louis, but to-day the market is firmer at the levels quoted. A gradual decline in the London market has also had its effect on prices here as well as on sales for export, which have declined.

Antimony.—Wholesale lots for early delivery are quoted at 11.87½c., New York, duty paid, supplies of the metal being scarce and demand moderately strong.

Aluminum.—Virgin metal, 98 to 99 per cent pure, from the leading interest is obtainable at not less than 33c., New York, while metal from other sources is quoted as low as 31c., New York.

Old Metals.—Business was quiet this week, but prices held firm. Lead is higher. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.50
Brass, heavy	14.00
Brass, light	10.00
Heavy machine composition	19.00
No. 1 yellow rod brass turnings	11.75
No. 1 red brass or composition turnings	16.00
Lead, heavy	8.00
Lead, tea	5.75
Zinc	5.75

Chicago

March 2.—With the exception of a few large orders, the bulk of trading in copper has been from second hands. The price remains unchanged. The market in tin has been highly speculative with the result that prices have been very erratic, present quotations being 63c. to 64c. Lead has advanced because producers are well sold ahead and do not wish to take on further commitments at present prices. Spelter has declined, but the recessions have brought out considerable buying. There have been no features in antimony. We quote Lake copper 19.50c. for carloads, tin 63c. to 64c., lead 9c. to 9.25c., spelter 8.87½c. and antimony 12.50c. On old metals we quote copper wires, crucible shapes, 15.50c.; copper clips, 15.25c.; copper bottoms, 14c.; red brass, 15.50c.; yellow brass, 11.25c.; lead pipe, 7c.; zinc, 6.25c.; pewter, No. 1, 37.50c.; tinfoil, 40c. and block tin, 50c., all these being buying prices for less than carload lots.

St. Louis

March 1.—The non-ferrous markets continue strong, with 8.90c. bid for lead in car lots and refused, the holders asking 9c. In spelter the price, in car lots, is firm at 9c. The last sale reported of lead was at 8.85c. for 500 ton lots. In less than car lots lead commands 9.25c. to 9.50c.; spelter, 9.50c.; tin, 65c.; copper, 20c.; antimony, 13c. In the Joplin district ore prices are firmer, with lead held at $102.50 per ton, basis 80 per cent; zinc blende, $52.50 per ton, basis 60 per cent, and calamine, $35 per ton, basis 40 per cent. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 9c.; heavy yellow brass, 10.50c.; heavy red brass, 15c.; light copper, 13c.; heavy copper and copper wire, 16c.; pewter, 35c.; tin foil, 42c.; zinc, 5c.; lead, 6c.; tea lead, 3c.; aluminum, 24c.

Thomas D. Wiles, attorney at Boston, has been appointed trustee in the bankruptcy case of the Signal Motor Truck Co., a Massachusetts corporation.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Prices quoted below represent as closely as they can be given those charged by mills to their regular trade for indefinite shipment. Owing to practical famine in supply of finished steel products and the heavy demand existing, tenders of new business are being made to the mills by jobbers and consumers at higher prices than those quoted below, but as a rule the mills are turning this offered business away)

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Jan. 1, 1920, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49.5½c.; Denver, 99c.; Omaha, 59c.; minimum carload 80,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload, 46,000 lb. Jacksonville, Fla., all rail, car lots, 41.5c.; less, 59c.; rail and water, car lots, 34.5c.; less, 46.5c. A 3 per cent transportation tax applies. On iron and steel items not noted above rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 3c.

Wire Products

Wire nails, $3.25 to $4.00 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire, $3 to $3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3 to $3.50; galvanized wire, $3.70 to $3.95; galvanized barbed wire and fence staples, $4.10 to $4.45; painted barbed wire, $3.40 to $3.75; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.50 base
Large boiler rivets.....$4.60 base
Small rivets .....50 per cent off list
Small machine bolts, rolled threads .....40, 10 and 5 per cent off list
Same sizes in cut threads.....40 and 5 per cent off list
Longer and larger sizes of machine bolts .....30 and 10 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter, rolled threads.40 and 5 per cent off list
Cut threads .....30 and 10 per cent off list
Longer and larger sizes.....30 per cent off list
Lag bolts .....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 head.....40 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....35 per cent off list
Longer and larger sizes.....25 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts .....2c. off list
Tapped nuts .....$1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
⅝-in. and larger .....60 and 5 per cent off list
9/16-in. and smaller.....70 and 5 per cent off list
9/16-in. and smaller A. L. A. M. or S. A. E.....70, 10 and 5 per cent off list
Stove bolts in packages.....70 and 10 per cent off list
Stove bolts in bulk.....70, 10 and 2½ per cent off list
Tire bolts .....55 and 10 per cent off list
Track bolts .....6c. base

One cent per lb. extra for less than 200 kegs. Rivets in 100 lb. kegs 25c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $65; chain rods, $70 to $75; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, $3.60 per 100 lb. in lots of 200 kegs, of 200 lb. each or more; spikes, ⅝-in. and 7/16-in., $4.25; 5/16-in., $5; track bolts, $4.90 to $5. Boat and barge spikes, $4.25 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C. $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4.00c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	1	+25
½	51	36½	⅜	25½	+1½
¾ to 3	54	41½	½	29½	11½
			¾ to 1½	34½	18½
			2 and 2½	33½	17½

Lap Weld

2	47	34½	1½	24½	9½
2½ to 6	50	37½	1¾	31½	17½
7 to 12	47	33½	2	28½	14½
13 and 14	37½		2½ to 6	30½	17½
15	35		7 to 12	27½	14½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	¼	+7	+40
½	48	35½	⅜	23½	6½
¾ to 1½	52	39½	½	28½	15½
2 to 3	53	40½	¾ to 1½	34½	19½
			2 and 2½	34½	19½

Lap Weld, extra strong, plain ends

2	45	33½	1¼	21½	6½
2½ to 4	48	36½	1½	27½	13½
4½ to 6	47	35½	2	29½	16½
7 to 8	43	29½	2½ to 4	31½	19½
9 to 12	38	24½	4½ to 6	30½	18½
			7 to 8	22½	10½
			9 to 12	17½	5½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	1¾ and 1⅞ in.	+20
2½ to 3¼ in.	30½	2 and 2¼ in.	+10
2¼ in.	24	2½ and 2¾ in.	+ 1
1¾ to 2 in.	19½	3 and 3¼ in.	— 1½
		3½, 4 and 4½ in.	— 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the steel corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

	Cents Per Lb.
Blue Annealed—Bessemer	
Nos. 8 and heavier	3.50 to 4.50
Nos. 9 and 10 (base)	3.55 to 4.55
Nos. 11 and 12	3.60 to 4.60
Nos. 13 and 14	3.65 to 4.65
Nos. 15 and 16	3.75 to 4.75
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.15 to 5.15
Nos. 22 to 24	4.20 to 5.20
Nos. 25 and 26	4.25 to 5.25
No. 27	4.30 to 5.30
No. 28 (base)	4.35 to 5.35
No. 29	4.45 to 5.45
No. 30	4.55 to 5.55
Galvanized, Black Sheet Gage—Bessemer	
Nos. 10 and 11	4.70 to 5.70
Nos. 12 to 14	4.80 to 5.80
Nos. 15 and 16	4.95 to 5.95
Nos. 17 to 21	5.10 to 6.10
Nos. 22 to 24	5.25 to 6.25
Nos. 25 and 26	5.40 to 6.40
No. 27	5.55 to 6.55
No. 28 (base)	5.70 to 6.70
No. 29	5.95 to 6.95
No. 30	6.20 to 7.20
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.15 to 5.15
Nos. 17 to 21	4.20 to 5.20
Nos. 22 to 24	4.25 to 5.25
Nos. 25 to 27	4.30 to 5.30
No. 28 (base)	4.35 to 5.35
No. 29	4.40 to 5.40
No. 30	4.40 to 5.40
Nos. 30½ and 31	4.45 to 5.45

Machinery Markets and News of the Works

RAILROADS MAY BUY

Some Inquiries Out for Machine Tools

Business Is Quieter, Many Buyers Being Discouraged by Inability to Obtain Good Deliveries

With the return of the railroads to private operation, on March 1, the machine-tool trade began to look for some railroad buying. Until the roads can make adequate financial arrangements it is not probable that this buying will assume large proportions, but the railroad repair shops are known to be badly in need of new equipment, and absolutely necessary purchases will probably be made soon. The New York, New Haven & Hartford Railroad has issued a list, which calls for 21 lathes and 14 radial drills. The Pennsylvania Railroad has received many quotations in the past 60 days, and will probably be among the first to buy. The Baltimore & Ohio is reported to be placing orders for its Ivorydale shops, near Cincinnati, and the Union Pacific Railroad is preparing a list of its tool requirements.

Car repairs will be one of the first requisites of the railroads. Car builders will in all probability be in need of more equipment, some inquiry having developed in the past week for second-hand plate-working machines, prompt delivery being the prime need. The American Car & Foundry Co., which has been considering a list of machine tools, stated last week to machine-tool sellers that it would shortly place orders.

In some markets a tendency toward reduced inquiry and buying continues to be noted. Long-deferred deliveries are having an effect, as many users of tools are not inclined to place orders for machines that cannot be had for several months. It is reported from New England that the directors of at least three large industries have recommended that machine-tool purchases be held up pending development of present uncertain financial conditions. Some smaller enterprises have taken the same attitude.

On the other hand, there is still a very fair volume of business, largely in single machines or small lots. A Chicago dealer reports February sales as the largest in his experience, and in that market both buyers and sellers seem to be regaining confidence, the prospect of railroad purchases having, perhaps, an effect in that direction.

In addition to tools being figured on by the railroads, a number of fair-sized inquiries from other sources have appeared. At Chicago a list calls for twenty-three 18-in. engine lathes, and if satisfactory deliveries can be obtained twice that number may be bought. The Federal Shipbuilding Co., Kearny, N. J., is in the market for quite a large lot of tools, and Stone & Webster, Boston, have issued a list for a Hartford, Conn., plant.

The General Electric Co. has bought extensively for its Lynn and Hudson, Mass., works, and is expected in the market soon for its Newark, N. J., and Harrison, N. J., plants. The Saco-Lowell Shops, Boston, has bought considerable equipment. The Detroit Gear & Machinery Co., Detroit, has also been a fairly large buyer. Tools have been sold in sizable lots for export to Japan and Mexico.

New York

NEW YORK, March 2.

With the return of the railroads to private ownership, some new business in machine tools is looked for, but there has been no indication as yet as to how extensive the purchases of the railroads may be. Several inquiries of good size have been issued by roads in various parts of the country during the past few months for estimating purposes. Machine-tool sellers have been of the opinion that railroad buying would not be much of a factor in the immediate future. However, manufacturers who make products which the railroads will need will probably come into the market. For example, the American Car & Foundry Co., which has been figuring on a large purchase of equipment, will probably place orders very soon. In the past week, also, there have been numerous inquiries for second-hand plate-working machines from car and locomotive builders. The New York, New Haven & Hartford Railroad has issued an inquiry for a number of tools.

The Federal Shipbuilding Co., Kearny, N. J., has received quotations on a large list of machine-tool equipment and is expected to place orders shortly. The Crowninshield Shipbuilding Co., South Somerset, Mass., has bought a number of fabricating tools, including a 30-ft. plate bending roll.

The Willys Corporation, Elizabeth, N. J., continues to buy for its new automobile plant, its latest purchase of size being about $100,000 worth of multiple spindle drilling machines. The General Phonograph Co., near Newark, has bought a number of machines.

For export to Mexico the Oklahoma Iron Works has bought about $75,000 worth of machine tools and Abe Kobei & Co., 120 Broadway, have closed for about $75,000 worth of tools for shipment to Japan.

The Edison Lamp Works of the General Electric Co., Harrison, N. J., is preparing a list, which will soon be issued. The General Electric Co. is expected to buy also for its works in Newark.

The Worthington Pump & Machinery Corporation, Harrison, N. J., has issued a list of about 35 miscellaneous machines it offers for sale.

Crane inquiries being received are not as numerous as during the past few weeks, although there are a number of concerns in the market for cranes of good size. It is reported that the Hartford Electric Light Co., Hartford, Conn., which recently purchased a locomotive crane, will soon be in the market for overhead traveling cranes for a 100,000-kw. power house to be constructed by Stone & Webster, New York. The Foundation Co., New York, constructing a plant near Buffalo for the Dunlop-America Co. has purchased two locomotive cranes. The United Shoe Machinery Co., Boston, has purchased from Alfred Box & Co., Philadelphia. The New England Structural Steel Co., Everett, Mass., has also placed its order. Among recent sales is a 10-ton overhead traveling crane sold by the Shepard Electric Crane & Hoist Co. to Gilbert & Barker, Springfield, Mass., and two 5-ton, four 3-ton and seven 10-ton Shepard electric hoists sold to the American Car & Foundry Co. The American La France Fire Engine Co., Elmira, N. Y., has purchased a 10-ton overhead travelling crane from the Bedford Foundry & Machine Co. for a new plant at Bloomfield, N. J.

The Beller Electrical Supply Co., Newark N. J., has been incorporated with a capital stock of $100,000 by Abraham Cohen, Robert and B. H. Beller, to manufacture electrical appliances.

The Day-Elder Motors Corporation, Colt and Twenty-first streets, Irvington, Newark, N. J., has acquired property adjoining its plant at Clinton Avenue and Twenty-first Street, and is having plans prepared for a new four-story unit of reinforced concrete, 75 x 252 ft., to cost $300,000. A large portion of the structure will be equipped for assembling work. W. E. Lehman, 738 Broad Street is the architect.

The Specialty Handle Mfg. Co., 115 New Jersey Railroad Avenue, Newark, N. J., has acquired property at 121-23 New Jersey Railroad Avenue, with building for plant extension.

The American Brake Shoe & Foundry Co., 30 Church Street, New York, has acquired about 17 acres at Avenue L and the Central Railroad of New Jersey, Newark, N. J., and proposes to use the site for a new plant. It is said that action on the preparation of plans will be deferred for a short time.

The United Automotor Parts Co., 89 Academy Street, Newark, N. J., has filed notice of organization to manufacture spark plugs. David Rosen is president.

The Vreeland Motor Co., Newark, N. J., occupying temporary plant at 407-9 Elizabeth Avenue, has plans under way for the construction of a permanent plant on Coit Street, Irvington, for the manufacture of motor trucks, with site approximating 8 acres. The initial building will be one story of brick and steel, 280 x 300 ft., and will be supplemented by two two-story structures, each 40 x 150 ft., to be equipped as a machine shop, and for general metal working, repair and storage, respectively; a one-story assembling works, 200 x 250 ft.; and two-story administration building, 50 x 180 ft. The plant is estimated to cost $350,000. E. E. Vreeland, is president. John T. Simpson, Essex Building, is the architect.

The Kno Soe Tool & Machinery Works, Newark, N. J., has filed notice of organization to manufacture tools, dies and machinery, with plant at 258 Halsey Street. J. Otto Somer, 158 West End Avenue, is president.

The Bijur Motor Appliance Co., Fifteenth Street, Hoboken, N. J., has increased its capital stock from $1,812,500 to $2,312,500.

Edward V. Harford, Inc., Carbon Place, Jersey City, N. J., manufacturer of shock absorbers, etc., has completed plans for a plant addition to cost about $15,000.

The Riverside Engineering Co., Paterson, N. J., has been incorporated with a capital stock of $50,000 by George R. Decnyf and Georg eW. Kent, to manufacture electrical products.

The William H. Atkinson Co., foot of Seventh Street, Hoboken, N. J., manufacturer of dredging machinery, has broken ground for a one story machine shop addition, 68 x 142 ft., to cost $25,000.

The E. Behringer Sheet Metal Works, Inc., 315 East Ninety-seventh Street, New York, has acquired property, 100 x 125 ft., occupied by a two-story brick factory at 116-120 Jabez Street, Newark, N. J., for a local plant to specialize in sheet-metal products, automobile radiators and dairy machinery.

The Modern Tool & Machine Works, 350 Mulberry Street, Newark, N. J., has increased its capital stock from $50,000 to $500,000.

The Wright Aeronautical Corporation of America, 40 Wall Street, New York, is taking bids for its new two-story brick and steel plant, 42 x 200 ft., at Frelinghuysen and Meeker avenues, Newark, N. J., to cost $300,000 including equipment. John W. Ingle, 527 Fifth Avenue, is the architect.

Nicholas M. Powell, Inc., New York, his been incorporated with a capital stock of $300,000 by Nicholas M. Powell, J. J. Fitzpatrick and M. R. Hutchinson, 233 Broadway, to manufacture airplanes, motors, parts, etc.

The Westinghouse Lamp Co., 165 Broadway, New York, is having plans prepared by Stone & Webster, 120 Broadway, for a plant addition at Milwaukee, Wis., to cost about $400,000.

The Manhattan Insulated Wire & Cable Corporation, New York, has been incorporated with a capital stock of $50,000 by S. A. Morrisey, R. H. Cherry and C. Kurzon, 155 East Houston Street.

The Harrolds Motor Car Co., 233 West Fifty-fourth Street, New York, has filed plans for a three-story brick addition, 80 x 120 ft., to its service and repair works on Fifth Avenue, near Freeman Avenue, Long Island City, to cost $250,000.

The Aetna Motors Corporation, New York, has been incorporated with a capital stock of $1,000,000 by V. P. Manne, H. May and W. P. Whelpley, 47 East 129th Street, to manufacture automobiles.

The Non-Vacuum Electrode Co., New York, has been incorporated with a capital stock of $50,000 by H. J. Sondheim, M. B. and H. A. Cone, 51 Chambers Street, to manufacture electrodes.

The Waite & Bartlett Mfg. Co., 252 West Twenty-ninth Street, New York, manufacturer of electrical equipment, is planning to remodel a five-story plant at Jackson Avenue and Fifth Street, Long Island City, for a new works.

The H. H. Babcock Co., 559 Factory Street, Watertown, N. Y., manufacturer of automobiles, is planning for a new power plant for works serivce to cost about $100,000.

The Crescent Diamond Die Corporation, New York, has been incorporated with a capital stock of $25,000 by R. Herschman, S. Mendel and D. Wolf, 45 East Seventeenth Street, to manufacture tools, dies, etc.

The Utica Electric Sun Signs, Inc., Utica, N. Y., has been incorporated with a capital of $36,000 by A. J. Haight, A. Klebs and W. B. Marstors, Jamaica, Long Island.

Ernest Haedrich, 618 Avenue M, Brooklyn, is having plans prepared for a one-story machine shop and automobile repair works, 54 x 78 ft., on Foster Avenue, near Ocean Parkway, to cost about $10,000.

The Air Reduction Co., 120 Broadway, New York, manufacturer of welding and cutting equipment, has increased its capital to an active amount of $4,000,000.

The Merchants' Metals Corporation, New York, has been incorporated with a capital stock of $1,000,000 by M. P. Kupfer, S. H. Kaufman and N. A. Haiblum, 60 Wall Street.

The Manhattan Electric Supply Co., 17 Park Place, New York, manufacturer of electricla specialties, has leased the building at 423 Broome Street for ten years, for general manufacturing.

The Universal Metal Spinning & Stamping Co., 318 Atlantic Avenue, Brooklyn, is having plans prepared for plant improvements to cost about $10,000.

The Lens Apparatus Co., New York, has been incorporated with a capital of $40,000 by L. H. Miller, N. H. Burofsky and A. G. Meyer, 517 West 136th Street, to manufacture electrical surgical instruments.

The New England Incandescent Lighting Co. has leased the building at 258 Elizabeth Street, New York, for a new electrical specialty works.

Paul M. Marko & Co., Atlantic Avenue, near Nostrand Avenue, Brooklyn, manufacturer of storage batteries, is having plans prepared for an addition to cost $10,000.

The Hampton Engineering Co., New York, has been incorporated with a capital stock of $15,000 by L. C. Cocheu, S. S. and S. F. Hampton, 6 Wall Street, to manufacture engines and parts.

The Navy Gear Mfg. Co., Port Chester, N. Y., has increased its capital stock from $150,000 to $300,000.

The Pro-Mo-Tor Fabricating Corporation, 245 West Fifty-fifth Stret, New York, has leased property at Locust Avenue and East 136th Street, for a new metal fabricating works.

The Standard Oil Co., 26 Broadway, New York, has perfected plans for expansion in a number of its refineries for increased production, with intention to develop an output of 300,000 bbls. of crude oil a day before the close of the year. The plant extensions will be made at Baltimore, Md., Parkersburg, W. Va., and Baton Rouge, La.

The Maccano Co., 46 West Twenty-fourth Street, New York, manufacturer of metallic toys, has increased its capital stock from $10,000 to $100,000.

The Gehnrich Indirect Heat Oven Co., Brooklyn, hsa sold its present two-story and basement plant, 50 x 107 ft., at 60 Franklin Avenue, with plans to concentrate manufacture at its new two-story works, 125 x 200 ft., at Buckley and Skillman streets, Long Island City, now being completed at a cost of about $100,000.

The Manhattan Rubber Mfg. Co., Willett Street, Passaic, N. J., manufacturer of mechanical rubber goods, is having plans prepared by Stone & Webster, 120 Broadway, New York, for a plant at Montville, N. J., for rubber reclaiming and manufacture, to cost about $200,000 including equipment.

Emerson International, Inc., 1780 Broadway, New York, manufacturer of talking machines, records, etc., has acquired the former canning plant of the Monmouth Seed Co., Lloyd Road, Matawan, N. J., one and two stories, with 48,000 sq. ft. of space, and will equip it for its own production.

The White Metal Mfg. Co., 1006 Clinton Street, Hoboken, N. J., manufacturer of collapsible tubing, etc., has taken bids for a three-story foundry, 20 x 80 ft., and a six-story metal-working shop, 135 x 135 ft.

The Presto Patch Co., Island Heights, N. J., has been incorporated with a capital stock of $125,000 by Erasmus Freeman, Alfred E. Freeman and W. P. Woodward, to manufacture metal products.

The W. & A. Fletcher Co., 1301 Hudson Street, Hoboken, N. J., operating a shipyard, has awarded a contract to William Crawford & Sons, 7 East Forty-second Street, New York, for a one-story shop addition to cost $25,000.

Edgar T. Ward's Sons Co., iron and steel jobber, has removed its offices and stocks from 304 Hudson Street to its other local warehouse at 260 West Street, and has secured additional warehouse quarters at Bush Terminal, Brooklyn.

The Nitrate Agencies Co., 85 Water Street, New York, has acquired 14 lots on West First and West Second streets, between Avenue A and the Boulevard, 194 x 287 ft., for a new plant.

The Yale Piston Ring Co., 560 West Thirty-sixth Street, New York, will build a one-story addition to its plant at Boonton, N. J., 60 x 100 ft., with additional equipment.

Sanderson & Porter, 52 William Street, New York, engineers, are preparing plans for a one-story, steam-operated electric power plant, 100 x 175 ft., for the Columbus, Delaware & Maryland Electric Co., Marion, Ohio.

Asbestos, Ltd., New Bound Brook, N. J., has been incorporated with a capital of $500,000 by N. E. and N. H. Newman, and John H. Jones, to manufacture asbestos products.

The Superior Body Co., Rahway, N. J., manufacturer of automobile bodies, has arranged for a stock issue of $500,000.

The Acme Storage Battery Corporation, Highland, N. Y., has increased its capital stock from $100,000 to $175,000.

The Safety Power Table Corporation, New York, has been incorporated with an active capital of $51,000 by T. F. Thornton, B. A. Leerburger and Ira Skutch, attorney, 100 Broadway, to manufacture clutches and brake devices.

The Automotive Equipment Co., Troy, N. Y., has been incorporated with a capital stock of $10,000 by W. Bentz, C. P. Snyder and P. J. George, Albany.

The Standard Oil Co., 26 Broadway, New York, has had plans prepared for a new one-story pumping plant at its works on Calyer Street, near Kingsland Avenue, Brooklyn, 45 x 90 ft.

Philadelphia

PHILADELPHIA, March 1.

The Gomery-Schwartz Motor Car Co., 128 North Broad Street, Philadelphia, has filed plans for its new eight-story, reinforced-concrete and brick service and repair works, 160 x 450 ft., on Twenty-fourth Street, Chestnut to Walnut streets, estimated to cost $1,250,000.

The National Bearings Service Co., 1410 Girard Street, Philadelphia, has filed notice of change of name to the Vacumeter Co.

The Precision Grinding Wheel Co., Torresdale Avenue, Holmesburg, Pa., has had plans prepared for a new one-story plant, 96 x 298 ft.

The Packard Motor Co., Atlantic City, N. J., is having plans prepared for a one-story service and repair building, 95 x 218 ft., on Boston Street.

The Alvord Reamer Co., Millersburg, Pa., has had plans prepared for a one-story brick machine shop, 40 x 80 ft.

The Pennsylvania Pump & Compressor Co., Easton, Pa., is being organized with a capital stock of $500,000 to establish a new plant in this section for the manufacture of hydraulic pumping machinery, air compressors, etc. A site of 55 acres has been acquired in the Bushkill Park section for the works, and it is planned to inaugurate construction at an early date to allow for the completion of a number of units for operation during next summer. Those interested in the new company are: Norman A. Messinger, works manager at the local plant of the A. S. Cameron Steam Pump Co.; William E. Anderson and Ellis Nathan, chief engineer and pump engineer respectively at the same plant; Ward Raymond, chief engineer at the West Easton works of the Ingersoll-Rand Co.; William C. Merwart, shop superintendent at this plant, and Ellis R. Snovel, purchasing agent at the works. Resignations from these present affiliations have been tendered.

The Lebanon Valley Iron & Steel Co., Lebanon, Pa., has inaugurated full capacity operations at its rivet department, Hebron, which were curtailed some months ago. New machinery has been installed for increased output.

The Franklin Brass Foundry Co., Reading, Pa., has increased its capital to $50,000.

The Trenton Patent Mfg. Co., Trenton, N. J., has been incorporated with a capital of $20,000 by William H. Jaeger, William Leedom and Duke A. Yergy, to manufacture piston rings, etc.

Emlen S. Hare, president the Mercer Motors Co., Trenton, N. J., has organized Hare's Motors, Inc., to act as an operating company for the Mercer organization and its affiliated interests, the Locomobile Co., Bridgeport, Conn., and the Simplex Automobile Co., New Brunswick, N. J.

The New Castle Rubber Co., New Castle, Pa., manufacturer of automobile tires, has arranged for a two-story addition, 45 x 65 ft., to cost $200,000 including equipment.

The National Pipe & Supply Co., Haverford, Pa., has been incorporated with a capital stock of $1,000,000 by Frank A. Cabeen, Jr., and associates to manufacture iron pipe, fittings, etc.

H. W. Hardinge, president the Hardinge Conical Mill Co., 120 Broadway, New York, manufacturer of cement-mill and stone-working machinery, has acquired a controlling interest in the Steacy Schmidt Mfg. Co., York, Pa., manufacturer of car wheels, boilers, tanks, machinery, etc., the holdings being those of the J. W. Steacy Estate and others. The company recently acquired about 3½ acres additional land near its works, and the new interests plan extensions. The company has been reorganized with the following officials: William H. Baker, president; Harlow W. Hardinge, vice-president; R. B. T. Kiliani, secretary and treasurer.

The Grohmann Motor Co., East Greenville, Pa., manufacturer of motor-truck engines, has acquired the machine works of J. S. Derr & Son at East Greenville and will use it for the manufacture of its regular products.

The Victory Tool Co., Waynesboro, Pa., has broken ground for a one-story machine-shop addition on South Potomac Street, to cost about $12,000. Harry Geist is president.

Pittsburgh

PITTSBURGH, March 1.

The new plant of the Liquid Carbonic Co., manufacturer of soda fountain equipment, Thirty-first Street and Kedzie Avenue, Chicago, to be located at Preble Avenue and Westhall Street, Pittsburgh, is estimated to cost $100,000. Plans are under way for a one-story plant, 120 x 148 ft.

The Beaver Valley Alloy Foundry Co., Monaca, Pa., has been incorporated with a capital stock of $30,000. C. E. Coleman, Rochester, Pa., is treasurer.

The Pittsburgh Steel Products Co., Union Arcade, Pittsburgh, is completing plans for its new plant at Charleroi, near Allenport, Pa., to cost about $500,000. The initial building will be one-story, 170 x 665 ft. Willis F. McCook is president; W. M. Selkvik is chief engineer, located at the company's works at Monessen.

The Electrical Engineering Co., Pittsburgh, has establish a plant at 7-9 West Canal Street, Northside, for the manufacture of switchboards, electric power control apparatus, etc.

The Vesta Coal Co., Pittsburgh, a subsidiary of the Jones & Laughlin Steel Co., will add new loading and unloading equipment, etc., at its different wharves.

The Climax Rubber Co., Huntington, W. Va., has acquired about 7 acres near Columbus, Ohio, as site for a new automobile tire and tube plant.

A number of West Virginia glass manufacturing plants are arranging for extensions and considerable glass machinery and general operating equipment will be required. The different projects include a new gas producer plant for the Equitable Window Glass Co., Buckhannon, W. Va.; the Libbey-Owens Sheet Glass Co., Kanawha City, has broken ground for an addition estimated to cost with machinery about $2,000,000. The West Virginia Glass Co., Huntington, is planning for two new plant units at its Westmoreland plant, each estimated to cost about $1,000,000 including equipment. The Hazel-Atlas Glass Co., Wheeling, has plans under way for a new factory building to cost $150,000. The Whittemore Glass Co., Dunbar, is planning immediate rebuilding of its blowing department, destroyed by fire, Feb. 12, with loss of about $100,000 including equipment.

The Pittsburgh Gear & Machine Co., Pittsburgh, has filed plans for a one-story brick and steel machine shop on Smallman Street, near Twenty-seventh Street, to cost $50,000.

The Mahoning & Shenango Railway & Light Co., Youngstown, Ohio, has completed plans for an addition to its electric power plant to cost over $1,000,000 including equipment. R. P. Stevens is president.

Charles L. Hills, 305 National Bank Building, Wheeling, W. Va., is inquiring for a steel building, 50 x 200 ft., with two 25-ft. bays for foundry purposes; also a 3 or 4-in. plain or universal radial drilling machine.

The Powell Pressed Steel Co., Youngstown, Ohio, has been incorporated with a capital stock of $225,000 to manufacture pressed and stamped steel products. The incorporators include W. J. Powell, who has been connected with the Youngstown Pressed Steel Co.; E. J. Powell and Ward Beecher.

Buffalo

BUFFALO, March 1.

The Philadelphia Rubber Works, Philadelphia, Pa., and Akron, Ohio, has awarded a contract to the Austin Co., 1612 Euclid Avenue, Cleveland, for two factory buildings for the manufacture of rubber tires and the reclaiming of old rubber, including a power house, two stories of brick and concrete, estimated to cost $1,000,000 equipped. The rubber plant will be on Niagara River, with industrial switch from New York Central Railroad, the site containing 106 acres.

Frank N. Trevor, Niagara Street and West Delaven Avenue, Buffalo, has had plans prepared for a brick factory building on Niagara Street and the New York Central Railroad, to cost $25,000. It has been leased for the occupancy of Charles S. Jacobowitz, machinery manufacturer and dealer.

The Brown, Lipe, Chapin Co., 110 Seneca Street, Syracuse, N. Y., has awarded contract from private plans to the DuPont Engineering & Construction Co., Wilmington Del., for a factory addition.

The U. S. Light & Heat Corporation, Niagara Falls, N. Y., manufacturer of electric batteries, etc., will build a two-story addition, 80 x 100 ft., at Highland Avenue and the New York Central Railroad.

The Pierce Brown Co., Inc., North Tonawanda, N. Y., W. B. Pierce, president, has awarded contract for a brick and steel foundry building at Wheatfield and River roads and New York Central Railroad, to Harding & Crea, White Building, Buffalo.

A two-story machine and repair shop to cost about $35,000, will be erected by the Jacob Dold Packing Co., 745 William Street, Buffalo, at 341 Howard Street.

The Auto Products Mfg. Co., 40 Elm Street, Buffalo, has increased its capital stock from $35,000 to $75,000.

In the appropriation bill passed by Congress, authority is given to the War Department to purchase the plant of the Curtiss Aeroplane & Motor Co., Elmwood Avenue, Buffalo, with future operation for Government service.

The Covert Gear Co., Lockport, N. Y., manufacturer of automobile gears and transmission, has awarded a contract to the Curran-Swartout Co., Rochester, N. Y., for a three-story addition to cost about $250,000 including equipment.

The Phelps Foundry Co., Phelps, N. Y., has been incorporated with a capital of $50,000 by T. Jones, W. R. Shaver and C. P. Downs.

The Consolidated Lens Mfg. Co., Rochester, N. Y., has increased its capital stock from $20,000 to $200,000.

The Selden Motor Co., Probert Street, Rochester, N. Y., manufacturer of motor trucks, is planning for a two-story addition, 100 x 140 ft., to cost $50,000.

The Board of Water and Lighting Commissioners, Jamestown, N. Y., has approved a bond issue of $250,000 for extensions to the municipal electric light and power plant.

The Cooper Brass Works, Ogdensburg, N. Y., has been incorporated with a capital stock of $200,000 by A. Cooper, T. H. Lawrence and J. R. Donahue, to manufacture brass and bronze specialties.

The Dyneto Electric Corporation, Wolf Street, Syracuse, N. Y., is reported planning the immediate purchase of machining equipment, including reamers, drills, sockets, milling cutters, taps, etc.

The Hickok Mfg. Co., 39 North Water Street, Rochester, N. Y., manufacturer of metal specialties, has increased its capital stock from $150,000 to $600,000.

The Arco Anti-Rail Creeping Co., Owego, N. Y., has been organized to manufacture railroad equipment, rail devices, etc. F. B. Tracy and J. R. Steele head the company.

The Oberdorfer Brass Co., East Water Street, Syracuse, N. Y., manufacturer of brass and aluminum castings, etc., has completed plans for a one-story foundry, 280 x 440 ft., at Messina Springs, near Syracuse, to cost about $300,000 including equipment. It will be equipped for the manufacture of automobile castings.

The George F. Uhlman Co., Binghamton, N. Y., has been incorporated with a capital stock of $25,000 by George F. Uhlman, W. L. Chittenden and W. G. Phelps, Jr., to manufacture electric signs.

Baltimore

BALTIMORE, March 1.

The Wizard Check Endorser & Printing Machine Co., 457 Calvert Building, Baltimore, recently incorporated, plans to establish shops in this city. Milling machines, drill presses, metal stamping presses, screw cutting machines, etc., will be installed. F. S. Weise is manager.

The National Auto Lock Co., 110 East Lexington Street, Baltimore, has been incorporated with $200,000 capital stock to manufacture an anti-theft vehicle lock. At a later date plans will be made to establish a plant in Baltimore. The incorporators are Abraham Rosenthal, Raymond K. Tongue and Harry C. Kalben.

The Drop Forge & Mfg. Co., 921 Sterrett Street, Baltimore, has been incorporated with $100,000 capital stock to manufacture iron, steel, brass, copper, zinc and tin products, etc. The incorporators are John M. Lawrence, George W. Mitchell and Walter E. Carroll. John H. Zink, 30 Light Street, also is interested in the project.

The Baltimore Copper Smelting & Rolling Co., Canton, Baltimore, will build a one-story steel and brick rolling mill, 204 x 330 ft., to cost about $130,000.

The Modern Electric Welding Co. of Baltimore City, 915 South Ann Street, Baltimore, has been incorporated with $100,000 capital stock to carry on the business of electric welding. The incorporators are Daniel J. Lynch, John M. Hoffman and Milton Roberts.

The Seamless Hollow Ball Co., Highlandtown, Baltimore, has stopped operating at its plant in order to re-equip its work with up-to-date machinery with a view to increasing output. It has planned to start manufacturing again about May 1. Charles K. Harrison, Jr., is president.

Reus Brothers, Inc., 146 Mount Royal Avenue, Baltimore, operating a general machine works, has awarded a contract to the Consolidated Engineering Co., Calvert Building, for a one-story metal-working plant, 100 x 200 ft., at Thornes Lane and the Western Maryland Railroad, to cost $40,000.

The Steinmetz Electric Motor Car Co., 512 Fifth Avenue, New York, is negotiating for an existing plant in the Baltimore district instead of erecting a plant, as previously intended. The bulk of operations at the new plant will be in assembling. N. W. Truett is secretary.

The Marine Engineering Corporation, 110 East Lexington Street, Baltimore, has completed plans for a one-story machine shop at the foot of Lakewood Avenue, 60 x 110 ft., to cost $12,000.

The Bethlehem Steel Corporation, Sparrows Point, Baltimore, is having plans prepared for plant additions to include a new sheet-metal working department, joiner shop, pipe shop, and power plant.

William J. Grove, president Grove Lime Co., Frederick, Md., is negotiating with the Farmers' Association for the erection of a hydroelectric power plant for county service on the Potomac and Monocacy rivers.

The Caroline Foundry Co., 723 South Caroline Street, Baltimore, has filed plans for a one-story foundry addition, 60 x 106 ft., to cost $10,000.

Dick B. Williams, Inc., Wilmington, Del., has been incorporated with a capital stock of $10,000 by Charles B. Bishop, S. H. Baynard, Jr., and H. N. Jefferson, to manufacture machinery for cracking and grading nuts.

The Ellicott Machine Co., Bush Street, Baltimore, has filed plans for a one-story addition, 60 x 125 ft.

The Sanitary Equipment & Construction Co., Wilmington, N. C., has been incorporated with a capital stock of $100,000 by G. W. Gillette, C. R. Humphreys and Clyde Harine, to manufacture septic tanks, metal specialties, etc.

The Crowell Automobile Co., Danville, Va., will build a two-story service and repair works, 110 x 175 ft., to cost $100,000 with equipment.

Michael & Bivens, Gastonia, N. C., are planning for the immediate erection of a new machine shop, 40 x 60 ft. It recently increased its capital stock to $100,000.

The Florida Iron Bed Co., Jacksonville, Fla., has been incorporated with a capital stock of $100,000 by John H. Elk, W. C. Kent and J. C. Connally, to manufacture iron beds, springs, etc.

The Charlottesville Aero & Motor Corporation, Charlottesville, Va., recently organized, has acquired the former motor truck barracks at the University of Virginia, and will equip the structure for the new line of manufacture. J. C. Coulter is president, and Robert E. Clark, secretary.

The Winding Gulf Colliery, Winding Gulf, W. Va., will call for bids about March 10 for its proposed one and two-story machine shop, 50 x 148 ft., to cost about $30,000. E. C. Berkeley is superintendent. Charles Worthington, Manassas, Va., is the architect.

The Ajax Foundry & Machine Co., Anniston, Ala., recently incorporated with a capital of $125,000, has plans under way for a one-story machine shop and foundry, 60 x 200 ft., for the manufacture of iron and steel castings, and machined specialties. The foundry will have a capacity of about 20 tons a day. J. B. Carrington is president.

M. Gorsuch, Holliday and Center Streets, Baltimore, has made application to establish a wood and metal pattern shop.

In connection with the establishment of a plant by the newly organized Baltimore Valve Co., Sinclair Lane and Mine Bank Lane, Baltimore, permission has been granted for the construction of a one-story machine shop and foundry, 30 x 60 ft., to cost $15,000. Ferdinand Robb is general manager.

The Gordon Bean & Pea Harvester Co., Elizabeth City, N. C., recently incorporated with $50,000 capital stock, will receive prices on foundry supplies. L. S. Gordon is manager.

The Greenville Iron Works, Greenville, S. C., plans to build a one-story machine shop, 50 x 120 ft., and a one-story foundry, 54 x 130 ft.

The Florida Machine & Engineering Co., Tampa, Fla., has been incorpated with $50,000 capital stock. A. E. Shaddock is general manager.

Chicago

CHICAGO, March 1.

Despite the rather erratic fluctuation of demand the past few weeks, one prominent dealer reports that February sales will exceed those of any other month in his experience in the trade, while another seller states that his record for the past month will be better than that for January, which was exceptionally good. Although reports from other sources are not so encouraging, it is probable that business was generally satisfactory. Temporary lulls in buying have been a source of concern, not so much because they have materially reduced aggregate sales but because they have been taken as posible signs of lessened activity in the months to come. It is also probable that the discouraging reports from Wall Street had a depressing effect on the market, but it is believed that both buyers and sellers are fast regaining confidence and that the apparent unsatisfied requirements of manufacturing plants and railroads will mean good business for many months.

There are numerous fair-sized inquiries before the trade, one of which calls for 23 18-in. x 10 ft. engine lathes, and this may be doubled if the machines can be secured without too much delay. While recent individual purchases have been largely confined to one or two machines, there are some exceptions to the rule. The Link-Belt Co., Chicago, for instance, bought two boring mills and four turret lathes.

No new railroad lists have made their appearance in this district, but with the return of the roads to their owners, it is believed that numerous inquiries will be sent out. The Union Pacific, for example, which has recently made large purchases of locomotives and cars, is known to be preparing a large list, and other carriers are no doubt doing likewise.

Deliveries are still a source of difficulty to dealers, although they have not yet reached the point where aggregate sales have been materially affected. Some significance, however, may be attached to the fact that a local dealer in new tools recently bought considerable machinery at Eastern arsenals.

The demand for machinery by public schools in this State will, no doubt, increase, as a result of a new child labor law, which has materially enlarged the attendance in both the grade and high schools. In Chicago the Board of Education is hurrying its building program to accommodate several thousand additional students A new high school is to be built at Kimball and Wilson avenues and plans are being drawn for a four-story addition to the Crane Technical High School, Jackson and Oakley boulevards. The Tilden Technical High School and the Carl Schurz High School are also to have additions.

The Ford Motor Co., it is reported, will construct an assembling plant on the Indiana Harbor Belt Railroad, near Brookfield, Ill., a suburb of Chicago.

The Steel & Tube Co. of America has let the fabricating contract for an addition to its machine shop at Indiana Harbor, Ind.

The Ursus Motor Co., automobile manufacturer, 1057 Milwaukee Avenue, Chicago, is having plans prepared by the Industrial Building Co., 38 South Dearborn Street, for a four-unit plant to be built at 6601 Grand Avenue. Plans for the first unit, a one-story building, 60 x 300 ft., have been completed and construction will begin soon, the Industrial Building Co. being the general contractor. This unit will cost $75,000, and a second unit, which will be a duplicate of the first, will be started about July 1. The third unit, 60 x 240 ft., including a power plant, will materialize next October, and the fourth unit, similar to the third, and a two-story administration building will follow later. The total cost of the structures will be about $375,000.

The Banner Mfg. Co., machinist, 1871 Clybourn Avenue, will soon award a contract through an architect for a one-story machine shop, 40 x 50 ft., to cost $12,000.

The Illinois Steel Co., South Chicago, Ill., will erect a one-story electrical repair shop to cost $2,500.

The American Brake Shoe & Foundry Co., Ninety-fifth Street and Cottage Avenue, Chicago, has awarded contracts for a one-story addition, 25 x 34 ft., to cost $2,500.

The Stewart Warner Speedometer Co., 1828 Diversey Boulevard, Chicago, has awarded contract for the erection of a six-story plant, 141 x 150 ft., near its present site, at an estimated cost of $400,000.

The Dole Valve Co., manufacturer of steam specialties, 208 Wells Street, Chicago, has awarded contracts for the construction of a two-story plant, 100 x 123 ft., at 1923-33 Carroll Avenue, to cost $90,000. It will be used for the manufacture of radiators and valves. The company recently bought some machine tool equipment.

The Maremont Mfg. Co., manufacturer of vehicle and automobile springs, has purchased from the Otis Elevator Co the residue of its holdings at Ashland and Laflin avenues and Sixteenth and Seventeenth streets, Chicago, comprising 82,580 sq. ft. The land is improved with two one-story brick buildings, 90 x 420 and 35 x 120 ft., which the company will occupy for manufacturing purposes.

Tht Anderson Electric & Specialty Co., has purchased a one-story brick building, 25 x 100 ft., at 935 North Wells Street, Chicago, from the Ilg Electric Ventilating Co. The purchaser recently leased two six-story buildings on Whiting Street from the Ilg company, for a term of 15 years, from May 1, 1920.

The Alemite Die Casting & Mfg. Co., 341 West Chicago Avenue, Chicago, has purchased a site, 437 x 570 ft., at the northeast corner of Washtenaw and Belmont avenues, and beginning next month will build a $400,000 plant of one and two-story buildings. It will have a floor space of 100,000 sq. ft. and will employ 1,000 men.

The Sewell Cushion Wheel Co., Detroit, will open a branch in Chicago and is having plans drawn for an assembling plant, which is to supply the demand for its wheels in Chicago and adjacent sections.

Emil Schmidt, president of the Des Moines City Railway and the Inter-Urban Railway Co., Des Moines, Iowa, will resign in May to become president of the Des Moines Foundry & Machine Co., recently incorporated with $100,000 capital stock. The company will commence the construction of works, consisting of a foundry, machine shop, pattern shop and heating plant, as soon as the weather permits, betwen South West Sixteenth and South West Eighteenth streets, south of the Rock Island Railroad.

The Comet Automobile Co., Decatur, Ill., contemplates the construction of a four-story addition for the manufacture of automobile bodies.

The A. Plamondon Mfg. Co., 24 North Clinton Street, Chicago, manufacturer of friction clutches, etc., has awarded contract to the Overland Construction Co., 29 South La Salle Street, for a one-story machine shop and metal working plant, 100 x 500 ft., at Fifty-second Street and Western Avenue, to cost about $250,000, including equipment.

The Hupp Automobile Corporation, Chicago, has filed notice of change of name to the Flexo Motive Corporation, at the same time increasing its capital stock to $10,000,000.

The H. J. Frank Foundry & Machinery Co., Second Street, Davenport, Iowa, has awarded a contract to Axel, Carlson & Co., Moline, Ill., for a one-story brick and steel addition, 80 x 100 ft., with cupola extension, 40 x 40 ft., to cost about $25,000.

Fire, Feb. 19, destroyed a portion of the plant of the Jones Motor Car Co., Wichita, Kan., with loss estimated at $200,000.

James G. Heggie & Sons, Inc., Joliet, Ill., manufacturer of ladles, kettles and other metal products, will build a one-story addition to cost about $65,000.

Cleveland

CLEVELAND, March 1.

The easing up in demand for machine tools, that first became noticeable about two weeks ago, continues and many believe that the peak in the buying has been passed, ifland while business is likely to continue good, there will not be the heavy demand for machinery that has prevailed in the past few months. Various causes are assigned for the lessening of the market activity. One that is perhaps having more effect upon the market than anything else is the delayed deliveries. This situation is steadily growing worse and many manufacturers because of delays in securing castings and other manufacturing difficulties are unable to deliver machines according to their schedules. Buyers are not inclined to place orders for machinery that they are unable to secure for several months and are ether staying out of the market or buying second-hand equipment. This has stimulated the demand for used machinery which is quite active. Other conditions that are apparently affecting the trade are the railroad embargoes and coal shortage, which are preventing manufacturers from operating at capacity and from shipping their product as fast as made. Another factor is the tightness of the money market, which makes it difficult to secure loans. Although round lot orders in inquiries have to a large extent disappeared, dealers continue to get a good volume of small orders, mostly for single tools.

The Peerless Drawn Steel Co., Massillon, Ohio, has increased its capital stock from $200,000 to $4,000,000, equally divided between common and preferred stock. The new financing was necssitated by the recent purchase of the plant of the Massillon Iron & Steel Co. and the plans of the Peerless company to install a bar mill in that plant.

The Advance Mfg. Co., Bucyrus, Ohio, has been organized with a capital stock of $300,000 to take over the business of the Bucyrus Machine & Tool Co. The new company will increase the output of gears, which have been made by the Bucyrus Company and will manufacture various automobile devices.

The Monarch Mfg. Co., Tiffin, Ohio, manufacturer of wash boards, will move its plants from Bascom and Bloomdale, Ohio, to Tiffin, where three buildings will be erected.

The Lovell Mfg. Co., Erie, Pa., has commenced the erection of two additions, one four stories, 80 x 270 ft., and the other two stories, 73 x 145 ft., of brick, steel and concrete.

The Tight Hard Tool Co., Erie, Pa., has been incorporated with a capital stock of $50,000 to manufacture tools. F. A. Veith, who has been superintendent of the Modern Tool Co., Erie, is at the head of the new concern.

The Lorain Motor Truck Co., Lorain, Ohio, has acquired a plant at Seneca Avenue and Twenty-eighth Street, where it will manufacture motor trucks. J. W. Morgan is president and general manager; L. J. Henninger, secretary, and H. T. Jackson, treasurer.

The Dover Mfg. Co., New Philadelphia, Pa., manufacturer of sad irons, plans to double its present capacity and is reported to have ordered a large amount of new machinery.

The Guth Automatic Gate Co., now located at Waverley, Ohio, has acquired the plant formerly occupied by the Thompson-Armstrong Co., London, Ohio, where it will remove shortly.

The plant of the Lincoln Stove Co., Fremont, Ohio, has been sold to F. J. Miller, Medina, Ohio, who is understood to be representing interests engaged in foundry work. The Lincoln company will secure another plant.

The American Refrigeration Mfg. Co., recently organized in Toledo, Ohio, with a capital stock of $100,000, has taken a 20-year lease on the plant of the Deshler Foundry & Machine Works, Deshler, Ohio, and will equip it for the manufacture of refrigeration plants.

The Lima Locomotive Corporation, Lima, Ohio, will erect an addition to its hammer shop, 100 x 240 ft. Additional power equipment will also be installed involving a total expenditure of about $400,000.

The Garford Motor Truck Co., Lima, Ohio, has placed a contract for the erection of a two-story building, 100 x 420 ft., for assembling purposes.

The Euclid Foundry Co., Euclid, Ohio, has acquired a site on St. Clair Avenue, near Bliss Road, on which it plans to erect a foundry.

The Maumee Tire & Rubber Co., Toledo, Ohio, has been incorporated in Delaware with capital of $27,500,000 by George T. Morrison, Jerome B. Patterson, Toledo, and Robert Butler, Barberton, to manufacture automobile tires and tubes.

Detroit

DETROIT, March 1.

The Cadillac Motor Car Co., Detroit, has broken ground for an addition to its plant, consisting of eight four-story buildings designed so as to be increased to six stories later. The main structure will be 600 x 800 ft., providing a total floor area of 970,000 sq. ft. Adjoining this will be a heat-treating plant, 80 x 500 ft., while the assembling works will be 360 x 800 ft. Other buildings will include steam and electric power plant, storage and administration buildings.

The United States Rubber Co., Morgan & Wright Division, Jefferson and Bellevue streets, Detroit, has awarded a contract to Stone & Webster, Book Building, for the erection of a two-story addition, 90 x 275 ft., with reinforced-concrete power plant. The extensions are estimated to cost close to $1,000,000 including equipment.

The Republic Motors Corporation, Alma, Mich., is completing plans for a one-story addition, 100 x 565 ft., to cost about $125,000.

The Rochester Machine & Foundry Co., Rochester, Mich., has plans under way for a one-story foundry addition, 60 x 128 ft., to cost about $25,000.

The Wilson Body Co., Bay City, Mich., manufacturer of automobile bodies, has taken bids for a three-story, brick and steel addition, 250 x 350 ft., to cost about $500,000 including equipment.

The Jackson Screw Products Co., 213 East Washington Avenue, Jackson, Mich., is taking bids for a one-story factory 50 x 120 ft.

The Monarch Foundry Co., 895 Greenwood Avenue, Detroit, has awarded a contract to the Austin Co., Penobscot Building, for a one-story foundry, 100 x 200 ft., to cost about $75,000.

The Anderson Forge & Machine Co., Detroit, has changed its name to the Jefferson Forge Products Co. and increased its capital stock from $700,000 to $1,000,000.

Contracts have been let for the new building, 60 x 140 ft., to replace the brass foundry, shipping and reserve room of the Howell Electric Motors Co. destroyed by fire Feb. 16. Half-time production has been in force since the fire, but temporary structures are now in use and it is hoped to get back to full production in the near future. The loss is estimated at $30,000.

To enlarge its activities, the Hamilton Motors Co., Inc., Grand Haven, Mich., has increased its capital stock from $500,000 to $750,000. William M. Connelly, Peter Van Zylen, W. G. Jarman, Louis H. Osterhouse and James W. Oakes have been made members of the board of directors.

The Chicago Stove & Range Co., Benton Harbor, Mich., has changed its name to the Benton Harbor Castings Co. The stockholders have passed a resolution approving a proposition to double the foundry capacity by the erection of a new building, 80 x 200 ft., to cost $30,000. The reason for the change of name was because the company is doing a general castings business almost to the exclusion of stove making.

The Soo Gas Engine Works, Sault Ste. Marie, Mich., has changed its name to the Loucks Mfg. Co., and will manufacture brass and bronze castings, propeller wheels and motor boat accessories.

Cincinnati

CINCINNATI, March 1.

While inquiry for machine tools has tapered off the past two weeks, some sizable lists are before the trade. The principal business being figured is from the New York, New Haven & Hartford Railroad, which has two lists out, one calling for 21 lathes, and another for 14 radial drilling machines. The list issued last week by the Detroit Gear & Machinery Co. has been received and it is reported that some business has been placed with manufacturers in this city. The Baltimore & Ohio is said to be purchasing equipment for its Ivorydale shops. These are the only railroad lists so far reported, though manufacturers expect that business from this source will be very brisk in the near future.

The Industrial Castings Co., Hamilton, Ohio, has been incorporated with a capital stock of $50,000. It will immediately commence the erection of a foundry 100 x 150 ft., which is expected to be completed and ready for operation about May 1. A. McGinnis will be general manager and T. Scott Beaton, secretary-treasurer.

Bids are being received by Samuel Hannaford & Sons, architects, for an addition to the plant of the Globe Folding Box Co., Cincinnati, two stories and basement, 80 x 225 ft.

The National Insulating Co. will, it is understood, move its plant from Lamberton, Ohio, to Parkersburg, W. Va., where a new building of the knock-down type, 80 x 216 ft. will be erected. J. H. Parker, Parkersburg, is president.

The Dayton Computing Scale Co., Dayton, Ohio, has awarded contract to Frank H. Smith for the construction of a five-story concrete structure on Hoffman Avenue, made necessary by the rapid growth of its business.

The Gartland-Haswell-Rentschler Co. has been organized to operate a grey iron foundry for light castings in Dayton and has acquired the foundry formerly owned by the Platt Iron Works Co. under lease from the Dayton Malleable Iron Co. The officers are: President, Gordon S. Rentschler, of the Hooven-Owens-Rentschler Co., Hamilton, Ohio; vice-president, M. F. Gartland; secretary-treasurer, John C. Haswell. Mr. Gartland is also president of the Gartland foundries, which are located in a number of cities in Ohio, Indiana and Illinois. Mr. Haswell is president of the Dayton Malleable Iron Co. and an officer in the various Gartland companies. Peter V. Gartland, who has been the general manager of the Gartland properties in western Indiana and Illinois, becomes general manager of the new company.

The American Mfg. Co., Dayton, has been incorporated with a capital stock of $100,000. It has taken over the assets and liabilities of the Pasteur-Chamberlain Co. and will manufacture washing machines. Albert B. Hilton, Jr., is president and treasurer.

The Progressive Die & Tool Co., Columbus, Ohio, has been organized with a capital stock of $200,000 to manufacture dies, jigs and fixtures. H. F. Gray, J. Voltz, G. Snashall, H. E. Brennan and J. P. Michael are the incorporators.

The Smith Scale Co., Columbus, has increased its capital stock from $50,000 to $200,000, and it is understood has plans under way for a further extension of its business.

The Climax Rubber Co., Columbus, has recently increased its capital stock from $300,000 to $1,500,000, and is contemplating the erection of a factory 100 x 300 ft., three stories and basement, of brick and concrete. Offices are in the Citizens' Bank Building. Irving S. Hoffman is president.

Plans are being prepared for an extension to the plant of the Warner Elevator Co., Spring Grove Avenue, Cincinnati. Two buildings will be erected, 40 x 175 ft., one story, and 70 x 90 ft., two stories. Bert Baldwin is the architect.

The Southern States Motor Corporation, Cincinnati, has purchased property on Ninth Street and will build a one-story garage, 60 x 150 ft.

A new plant, costing approximately $150,000, is to be constructed by the Davis Welding Mfg. Co., Cincinnati. It is at present operating three plants in different parts of the city, all of which are to be consolidated when the new buildings are erected. The company is making a specialty of manufacturing tanks used for delivering oil to filling stations, and the first building to be erected will be a tank shop, containing approximately 30,000 ft. of floor space. New machinery will be purchased. Augustine Davis is president.

The Karl Kiefer Machine Co., 919 Martin Street, Cincinnati, is having plans prepared for a two-story addition, 50 x 150 ft., at Martin and Pearl streets. Karl Kiefer is president.

The Harlan Electric & Machine Works, Harlan, Ky., has been incorporated with a capital of $75,000 by G. H. Black, A. C. Jones and F. C. Tarvin, to manufacture electrical and mechanical equipment.

The Pittsburgh Malleable Iron Co., Pittsburgh, is considering the erection of a one-story foundry, 118 x 300 ft., at Zanesville, Ohio. J. B. Coates is vice-president.

The Estate Stove Co., Hamilton, Ohio, has increased its capital stock from $825,000 to $1,000,000 to provide funds for a substantial addition to its enameling plant and other shop improvements. The paid up capital of the company is $500,000 six per cent cumulative preferred and $500,000 common stock. D. F. Kahn is general manager.

New England

BOSTON, March 1.

The past week has witnessed a decided slowing up in local machine tool business owing to transportation conditions and an inclination to go slow on the part of some prospective buyers. The directors of at least three large New England industries have recommended that machine tool purchases be held up pending national developments and some smaller enterprises have done likewise. No weakening in quotations is noticeable, however. Prices paid for the equipment of the J. N. Lapointe Co. of Massachusetts, Hudson, Mass., offered the past week at auction, were high, in some instances higher than the local second-hand tool market. Deliveries in New England have been set back two weeks or longer because of the transportation situation. Machine tool makers in western Massachusetts are still unable to get cars in which to ship new equipment and some dealers have been unable to get small tools through by express. One house paid $45 to get a small drill from Philadelphia to Boston.

The General Electric Co., Lynn, has been the largest purchaser the past week. Stockholders this month will be asked to increase the company's capitalization from $125,000,000 to $175,000,000,000 to provide additional working capital, some of this money to be invested in machine tools. Part of the equipment bought recently is for its new Hudson plant. The Saco-Lowell Shops, through W. H. Savage, Fitchburg, has bought considerable equipment, but has not covered all its requirements. The list of purchases by the Bridgeport Chain Co., Bridgeport, Conn., has been sidetracked. The Boston & Maine Railroad is planning a large expenditure for rolling stock and bridges and as soon as purchases are made will give attention to machine shop equipment. The Boston industry, which recently issued a long list for its Far East branch, has decided to buy most of the equipment in Europe, owing to the rate of exchange. Stone & Webster have a large list for a Hartford, Conn., plant, which includes 16-in. lathes with 8-ft. beds, 16-in. self-feeding drill presses, 20-in. self-feeding drill presses, 16-in. shapers, bolt threading machines, engine lathes, upright and radial drills, planers, etc. Prompt deliveries are wanted, however. The Murray & Tregurtha Co., Neponset, Quincy, Mass., has bought equipment, but wants quick delivery on a Lincoln and a universal milling machine. The Eastern Massachusetts Street Railway (Bay State) is in the market for two coach wheel lathes and two combined punch and shears, as well as some smaller equipment. The Trimount Mfg. Co., Roxbury, Mass., is interested in a double spindle drill, and the A. P. McCulloch Machine Co., Boston, wants a four-spindle drill for its Sandwich, Mass., plant. The Fore River Shipbuilding management is interested in some large machine tools, and Lever Brothers, Cambridge, Mass., have inquiries out for about $10,000 worth of machine shop equipment. The J. H. Howe & Sons Co., Lawrence, Mass., bought a 36-in. lathe and a special planer, and the Portsmouth Navy Yard, Portsmouth, N. H., a few small tools. The Northway Motors, Natick, Mass., continue to buy, but on a limited scale. The company urgently needs tools which have been in transit several weeks. The Woburn Gear Works, Woburn, Mass., has recently bought production tools and the Mead-Morrison Mfg. Co., Boston, has covered most of the requirements for its Ontario plant.

No crane sales are reported. There is, however, considerable tentative business in the market, which possibly will be closed before the end of another week.

The Hopkins Mfg. Co., Boston, capitalized for $30,000, has been incorporated to manufacture machinery for the dyeing, cleaning and laundry industries. Negotiations are in progress for a plant in Allston and it is hoped to start operations early this spring. Alfred Hopkins, 15 Ashford Street, Boston, is president; Jacob Polisner, 20 Crawford Street, Roxbury, vice-president, and George W. Robinson, 59 Naples Road, Brookline, treasurer.

The New England Westinghouse Co. has acquired eight acres adjoining its property in East Springfield, Mass., for use in the further extension of its plant, at a consideration of about $10,000.

The New England Tool & Machine Co., Springfield, with a capital stock of $25,000, has taken out a charter to manufacture and repair machinery and tools. It has acquired the machine shop property at 51 Taylor Street, recently occupied by the Rider Bagg Co., and plans a complete rearrangement and the installation of new equipment. Harold J. Craig, 15 Mapledell Street, Springfield, is president; Max J. Cohen, 105 St. James Avenue, Chicopee Falls, treasurer; and Walter Hogarth, 49 Reed Street, Springfield, clerk.

The Worcester Grinding Co., Worcester, Mass., with a capital stock of $10,000, has been incorporated with Henry W. Northridge, 7 Rockwood Avene, president, and Edgar G. Woodward, 78 West Street, treasurer.

Plans are being drawn for a ship repairing plant on Border Street, East Boston, for the Bertelsen & Peterson Engineering Co. J. L. Bryne, 53 State Street, is the engineer.

The New England Foundries, Inc., capitalized for $100,000, has been chartered to operate a foundry and machine shop. E. Arthur Tutein, 50 Congress Street, Boston, is president and treasurer. No site for the location of the plant has been made as yet.

The Winnisimet Ship Yard, Inc., has applied for a Massachusetts charter. It will be capitalized for $1,000,000, will take over the business, plant and property of the Massachusetts concern of the same name.

Plans are being drawn for a one-story foundry, 100 x 500 ft., for the Windsor Foundry Co., Windsor, Vt. It has a large amount of business on its books and finds expansion necessary.

Contract has been let for the construction of a building, 112 x 109 ft., for the Bridgeport Casting Co., Bridgeport, Conn.

Walter G. Penfield, president Sturdi-Truck Co., Holyoke, Mass., has transferred the land and factory, formerly the Gavin & Moriarity building, to the company, which will begin the manufacture of lifting trucks.

The G. H. Dyer Co., Cambridge, Mass., pistons, tools, automobile accessories, is doubling its capacity by the erection of a two-story building, 42 x 78 ft., on Brookline Street.

The General Electric Co., Lynn., has bought additional land at Hudson, Mass., and plans to build an addition to the former plant of the J. M. Lapointe Co. of Massachusetts, which it recently acquired.

A four-story extension, 40 x 31 ft., to the addition being erected at the plant of the William Scholhorn Co., Wallace Street, New Haven, Conn., clippers, pliers, etc., will be made.

The Holmes Mfg. Co., Shelton, Conn., air-cooled gasoline motors and tractors, has plans for extending its plant by the erection of a 50 x 150 ft., two-story addition.

The Carlisle Tire Corporation, Andover, Mass., pneumatic rubber tires, will build a plant on land acquired on Fairfield Avenue, Stamford, Conn., which will allow for an increase in production of 1000 tires per day. The Andover business will be moved to Stamford when the new plant is completed.

The Presteel Mfg. Co., Bridgeport, Conn., has been reorganized with a capitalization of $50,000. It has acquired a three-story factory at Logan and Connecticut avenues, Bridgeport, which it will occupy, for the manufacture of pressed metal chairs, vehicles and specialties. J. Ciglar, Jr., is secretary.

The Burr Appliance Co., Holyoke, Mass., has been incorporated with a capital of $250,000 by Charles D. Heywood and Russell I. Davenport, Holyoke, and Charles F. Munder, Springfield, to manufacture mechanical and electrical equipment.

The A. C. Gilbert Co., New Haven, Conn., manufacturer of steel construction toys, electric fans, etc., has arranged for a preferred stock issue of $400,000.

The New Haven Iron & Steel Co., New Haven, Conn., has filed notice of dissolution.

A two-story boiler plant addition, 48 x 80 ft., to cost $50,000, will be erected at the textile plant of the King Philip Mills, 372 Kilburn Street, Fall River, Mass.

The Kelley Tire & Rubber Co., New Haven, Conn., has awarded a contract for the erection of its proposed new plant to the Charles R. Hedden Co., Broad Street, Newark, N. J., at a cost of $259,103. The main buildings to be erected at West Haven, will include a three-story factory, 83 x 280 ft.; power plant, 50 x 60 ft., and two one-story shops, 20 x 40 ft. Edward J. Kelley is president.

The Boston & Lockport Block Co., 100 Condor Street, East Boston, Mass., manufacturr of blocks, hoisting tackle, etc., has awarded a contract to the S. C. Sperry Co., Cambridge, for the erection of an addition to cost about $150,000. A contract for two one-story shops, 20 x 100 ft., and 40 x 40 ft., has been let recently to the Milliken Brothers Mfg. Co., Woolworth Building, New York.

The Acme Special Machine Mfg. Co., 14 Sigourney Street, Hartford, Conn., has been organized with E. R. Seifert as president, and F. K. Landa, secretary and treasurer, to manufacture special machinery and parts. The company was incorporated recently with a capital stock of $26,500.

The Bridgeport Hardware Mfg. Co., Bridgeport, Conn., has increased its capital to $100,000.

The Modern Brass Foundry, 799 Eddy Street, Providence, R. I., has filed notice of organization to manufacture brass, bronze and other metal castings. Pierre A. Beaulieu, 82 Marshall Street, heads the company.

The Inter-State Machine Products Co., New London, Conn., has filed notice of dissolution.

The Rogers Drop Forging Co., which is the reorganization of the A. H. Steele Co., Worcester, Mass., will increase its capital stock from $22,000 to $150,000. The officers are: President, J. R. Rogers; treasurer, Francis P. Rogers, Jr.; secretary, J. E. Rogers, who also constitute the board of directors. Francis P. Rogers, Jr., will be the manager of both A. Hankey & Co. and the Rogers Drop Forging Co. The plant on Frank Street is modern in every way, but lacks the space for the proposed increase in production. Plans are being drawn to enlarge the works 50 per cent. and to install new machinery, including tools for the die department.

The name of the Worcester Machine Works, Worcester, Mass., manufacturer of internal grinding machines, has been changed to the Churchill, Morgan, Crittsinger Co. The officers are: President, Ralph L. Morgan; treasurer and general manager, Lewis M. Crittsinger; and the third director, Edwin Churchill. It had planned to erect new works this season, but has given this up on account of high costs. Its present shops are at 25 Bartlett Street and the offices at 393 Main Street.

The Norton Co., Worcester, Mass., is preparing plans for an addition to its machinery division, formerly conducted as the Norton Grinding Co., to consist of a six-story steel and cement building, 75 x 150 ft., to give 67,500 sq. ft. of new floor space. The immediate purpose of the structure is to house the pattern shop, carpenter shop and cooper shop, and to give space for the storage of finished parts and finished machines. Later on, as the machinery division needs more room, the building will be given over to that purpose. The Worcester plant of the Norton Co. now has 30 acres of floor space, of which seven acres are occupied in building grinding machines. The addition will give another acre and a half.

Indianapolis

INDIANAPOLIS, March 1.

The Peerless Machine Works, North High Street, Muncie, Ind., has increased its capital stock from $10,000 to $50,000 to provide for the early erection of a new factory to take care of its increased business. Charles B. Atherton is president and general manager.

The Rapid Rim Co., Huntington, Ind., has increased its capital stock from $500,000 to $5,000,000 to provide for enlargements and manufacturing facilities for the production of automobile accessories.

The Vincennes Foundry & Machine Shop, Vincennes, Ind., will build a new plant, 80 x 150 ft., on Nicholas Street, between Fourteenth and Fifteenth Streets.

The Lava Metal Co., Kokomo, Ind., has been incorporated with $50,000 capital stock to manufacture metal products. The directors are Ollie H. Buck, David C. Jenkins and Leonard B. Hodgin.

The Columbia Iron Works, Columbia City, Ind., has increased its capital stock from $20,000 to $75,000.

The Indiana & Michigan Electric Co., South Bend, Ind., has increased its capital stock from $5,000,000 to $11,500,000.

The Ripley Cultivator Motor Tractor Mfg. Co., Aurora, Ind., has been organized with the following officers: President, Nathan M. Ward; vice-president, John E. Demaree; secretary, Omer P. Shook; treasurer, William P. Castner. A two-story brick building has been leased and will be equiped for manufacturing.

The Western Drop Forge Co., Marion, Ind., will build a one-story addition, 70 x 200 ft.

The Oglesby Furnace Stove Co., Clinton, Ind., has increased its capital stock from $50,000 to $100,000.

The William Small Co., Indianapolis, manufacturer of automobiles, has increased its capital stock from $1,000,000 to $3,000,000.

The Crothersville Water & Electric Co., Crothersville, Ind., has been incorporated with $50,000 capital stock to furnish light, heat and power. The directors are W. P. Rider, C. W. Keach and H. B. White.

The Commercial & Experimental Machine Co., Indianapolis, has been incorporated with $65,000 capital stock to conduct a general machine shop. The directors are Edwin S. Harter, Thomas L. Wayne and Lee R. Hartley.

St. Louis

ST. LOUIS, March 1.

The New Orleans Railway & Light Co., New Orleans, J. S. Bleecker, general manager, will install one 15,000-kw. turbine, with condenser and auxiliaries, one 1500-kw. 125-250 volt rotary, pumps, fuel oil storage and other equipment.

The People's Electric Co., Mariana, Ark., M. D. Miller, president, will equip a plant for generating current, involving about $60,000 worth of machinery.

The Lehmann Machine Co., 606 South Broadway, St. Louis, will equip a two-story plant of 50,000 sq. ft. of floor space for manufacturing lathes.

The Associated Producing & Refining Corporation, Mansfield, La., will erect a 10,000 bbl. refinery.

The Lake Charles Canal Co., Lake Charles, La., will install about $50,000 worth of pumping machinery in its irrigation system.

The Clarksdale Creamery Co., Clarksdale, Miss., Allen L. Moore, president, is in the market for two 10-ton refrigerating machines, mixers, etc.

The New Orleans Motor Truck Mfg. Co., E. C. Patton, president, 5300 Tchoupitoulas Street, will install machine tools and other equipment for the manufacture of trucks of 1, 1½, 2½ and 3½ ton capacity.

The Surety Tire & Tube Co., St. Louis, W. L. Burgess, general manager, Kienlen Avenue, will enlarge tire and tube plant to 5,000 casings per day and is in the market for machinery.

The Floradel Knitting Mills, Charles A. Kaufman, president, New Orleans, is in the market for boilers, electric motors, etc.

The Long-Bell Co., Quitman, Miss., is in the market for a left hand, heavy duty Corliss engine.

The Berg Safety Crank Co., 210½ Louisiana Street, Little Rock, Ark., has established a factory at Fourth Street and Rector Avenue for the production of an anti-kick and anti-theft crank for Ford automobiles and trucks. It expects to reach a production of 1200 to 1500 a week in a short time. C. J. Berg is secretary.

The Curtiss Motor Car Co., Urquhart Building, Little Rock, Ark., manufacturer of automobiles and parts, is planning for the erection of a new one-story plant, 300 x 600 ft. A. W. Sloss is manager.

The Blue Bird Mfg. Co., St. Louis, manufacturer of electric washing machines, has increased its capital stock from $1,000,000 to $4,500,000.

The Tulsa Stove & Foundry Co., Sand Springs, Okla., is planning for the erection of a one-story foundry, 70 x 320 ft., to cost about $50,000.

The Central South

LOUISVILLE, March 1.

The Southern Veneer Mfg. Co., Louisville, has increased its capital to $100,000 and is planning enlargement of its power plant and the installation of additional veneer cutting machinery. George Kretchmer is superintendent.

The Home Development Co., Louisville, Bruce Haldeman, president, has obtained a site in New Albany, Ind., for a planing mill, and will purchase equipment immediately.

The Monon Veneer Co., New Albany, Ind., has purchased five acres of land from the Pekin Hardwood Lumber Co., and will equip a veneer plant. The company is capitalized at $50,000 by George Lapping and others of the Floyd County Veneer mills, Louisville.

The Douglas Garage, Seng & Wilhelmi, owners, Douglas Boulevard and Bardstown Road, plan the installation of a drill press, electric drill, and acetylene outfit.

The Paducah Electric Co., and Paducah Railway Co. will spend $250,000 on improvements to the power plant and other properties.

The Kentucky Wagon Mfg. Co., Louisville, has purchased six additional acres at a cost of $31,500, and has adjoining land under consideration. Plans are being discussed for enlarging the machine shops.

The Visible Measure Gasoline Dispenser Co., Louisville manufacturer of gasoline pumps, has plans for an addition to the machine and foundry departments at Seventh and Breckinridge streets.

The Kingsport Coal & Ice Co., Kingsport, Tenn., will equip an ice plant and will spend $25,000 on machinery.

The Business Men's Association, Bardstown, Ky., contemplates the equipment of a $30,000 ice plant.

The Southern Automobile Mfg. Co., Memphis, Tenn., recently organized, has acquired about 7 acres for the erection of a new plant for the manufacture of pleasure automobiles. With machinery it is estimated to cost $250,000. W. A. King is president, and William A. Shibley, secretary and treasurer.

Milwaukee

MILWAUKEE, March 1.

The volume of new business booked by local machine tool manufacturers in February showed a marked gain over the same month last year. While it is hardly fair to make a comparison with the peak-month of the war, it may be said that trade in the month just ended made a respectable showing against February, 1918. Inquiry continues active, although conservatism is noted in some quarters in the actual placement of new business, which is attributed to general conditions.

The Conradson Machine Tool Co., Green Bay, Wis., is increasing its working force from 110 to 250 to bring production up to the maximum of capacity of its new plant, completed a short time ago. Within 60 days it expects to break ground for a second unit. C. M. Conradson is president and general manager. E. L. Harting, of the Joseph T. Ryerson & Sons Co., Chicago, is a director, with headquarters in Green Bay.

The Westinghouse Lamp Co. will make an investment of approximately $400,000 in the enlargement of its Milwaukee works at 3100 Center Street. A contract has been awarded to Stone & Webster, consulting engineers, Chicago, for two two-story additions, 80 x 250 and 80 x 200 ft., respectively. These will be ready for occupancy about July 1 and provide 100,000 sq. ft. of additional floor space. The working force will be increased from 550 to 900. Harry M. Robins is general manager at Milwaukee.

The Nash Motors Co., Kenosha, Wis., has plans for a three-story body shop, 40 x 1120 ft., of brick and steel. The American Bridge Co. has taken the contract for the structural steel. With equipment the addition will cost about $380,000.

The Inland American Tractor Co. of Eau Claire, Wis., has been organized with a capital stock of $1,000,000 by a syndicate of local capital and members of R. D. Nuttall Co., Pittsburgh, manufacturer of gears and pinions. It will manufacture a crawler type of farm and general purpose tractor rated at 15-30 hp. A. A. Robbins, president Producers Paper Co., St. Paul, Minn., is president and general manager. Members of the Nuttall company who are interested include Milton Ruppert, vice-president; Lester H. Klein, general manager, and R. D. Nuttall. Edward Hutchens of Eau Claire is vice-president in charge of engineering and construction.

The Menominee Motor Truck Co., Clintonville, Wis., a new $500,000 corporation organized recently to take over a Michigan corporation of similar name, with factory and offices at Menominee, Mich., has decided to transfer the operation to Clintonville. Owners of the company are officers and stockholders in the Four Wheel Drive Auto Co., Clintonville. This plant will accommodate the Menominee plant until new shop buildings can be erected later in the year. W. A. Olen is president of both corporations.

The Hackendahl & Schmidt Co., Sixteenth and Canal streets, Milwaukee, manufacturer of structural and ornamental steel and iron work, has increased its capital stock from $25,000 to $50,000. An erecting shop addition is now being completed.

The Manitowoc Plating Works, Manitowoc, Wis., has increased its capital stock from $35,000 to $75,000 and will erect a solid brick factory addition, 100 x 100 ft., duplicating the present shop, built a year ago. Walter Wachowitz is president and general manager.

The Kimberly-Clark Co., Menasha, Wis., paper manufacturer, has decided to erect a new Eastern mill at Niagara Falls, N. Y., at an estimated cost of $1,500,000. The capital stock has been increased from $3,000,000 to $5,000,000 to finance the project. Stephen R. Stilp of Kimberly, Wis., is in charge of engineering and construction.

The Waukesha Mfg. Co., Waukesha, Wis., will rebuild immediately its planing mill and interior woodwork factory, which was totally destroyed by fire on Feb. 19, with a loss of $50,000. New wood-working machinery, power and electric motor equipment will be required.

The General Tool & Mfg. Co., 389 Fourth Street, Milwaukee, has increased its capital stock from $25,000 to $50,000 to accommodate the growing volume of business.

The Dahlmann Machine & Mfg. Co., Milwaukee, has been organized with $15,000 capital stock to manufacture special machinery, tools, jigs, dies, etc. The incorporators are Paul Dahlmann, Alfred R. Buchholz and George Moerschel, 912 Thirty-seventh Street.

The Oshkosh Motor Truck Co., Oshkosh, Wis., has decided to decline offers from Milwaukee and other cities to transfer its operation and will proceed with the erection of a new plant financed by Oshkosh interests. It is a $500,000 corporation making quadruple-drive commercial vehicles and has been conducting its business in leased quarters for three years. W. A. Besserdich is chief engineer.

The Waukesha Brass Foundry Co., not the Waukesha Foundry Co., will erect a new plant at Waukesha, Wis. Contrary to previous reports, the shop will be equipped for producing brass and bronze castings, mainly for the automotive industries. A site, 170 x 300 ft., has been purchased from the Federal Bridge & Structural Co. for a brick and steel building, 50 x 200 ft., costing about $45,000 with equipment.

The Splitex Radiator & Mfg. Co., Racine, Wis., has increased its capital stock from $50,000 to $150,000. It manufactures radiators for automobiles, motor trucks and tractors and is preparing to enlarge its factory and install new equipment.

The Auto Lock & Novelty Co., Eau Claire, Wis., has been granted a charter to manufacture patented automobile locking devices and general automotive metal equipment. The capital stock is $20,000 and the incorporators are Samuel S. Swan, James Forest, Ben O. Hanch and Frank J. Zivney.

Ray Hebenstreit, Shullsburg, Wis., is taking bids for the erection of a one-story and basement public garage and repair shop, 54 x 122 ft., costing about $15,000.

The Board of Industrial Education, Eau Claire, Wis., has engaged Schlintz & Bailey, architects, 53 West Jackson Boulevard, Chicago, to design a three-story junior high and vocational school building, 100 x 182 ft., estimated to cost $175,000. P. T. Favell is secretary.

E. G. Pannier & Son, Chippewa Falls, Wis., manufacturers of agricultural machinery, are taking bids for the construction of a two-story factory, sales and office building, 130 x 200 ft., designed by Schlintz & Bailey, architects, 53 West Jackson Boulevard, Chicago. The estimated cost is $150,000.

The Highway Trailer Co., Edgerton, Wis., which recently completed an addition, will break ground March 10 for another unit, 60 x 200 ft., costing $45,000. It is to be ready June 1 and will enable the company to increase its output to 25 complete trailers daily.

Texas

AUSTIN, Feb. 28.

W. W. Rodgers, Sherman, and associates, plan to build a cold storage and ice manufacturing plant at Denton at a cost of $60,000.

The Port Houston Oil & Refining Co. has purchased the new refinery of Monroe & Hughes, on the ship channel near Houston, and will buy additional equipment. The present capacity is 6000 bbl. a day, which will be increased to 10,000 bbl. The company has a capital stock of $250,000.

The Denison Oil & Refining Co., Denison, which was recently incorporated with a capital stock of $500,000, is preparing to construct an oil refinery to cost about $500,000. E. H. Bruyer, Waco, is president; B. J. Lindsay, Denison, vice-president; and L. L. Shackelford, Denison, secretary-treasurer.

The Mogul Oil & Refining Co., Orange, has secured a site for a refinery which it is to build at a cost of $1,000,000. W. M. Blake is president.

The Lone Star Motor Truck and Tractor Association, which recently took over the plant of the San Antonio Tool Works, will conduct the business as a separate corporation. It will build a new plant for the manufacture of oil field tools to cost about $100,000.

The Lone Star Bed Co., Dallas, will build a second factory in that city for the manufacture of combination wood and metal beds. The new building will be 75 x 150 ft., with a capacity of 25,000 beds annually. I. Sulsky is general manager.

The Texas Independent Pipe Line Co. has acquired holdings in the Tampico, Mexico, oil fields which it will develop and will also build a refinery. Its principal office is at Fort Worth.

The Victory Oil Co., through E. G. Kempner, Dallas, general manager, has signed a contract with the industrial committee of the Chamber of Commerce, Hillsboro, for the construction of a 1000-bbl. refinery.

The Missouri, Kansas & Texas Railroad, with general offices at Dallas, will rebuild its shops at Walnut Springs, which were recently destroyed by fire.

The Oil Belt Power Co., Eastland, Tex., has plans under way for a new hydroelectric power development to cost about $2,000,000. A steel and reinforced concrete power plant will be erected on the Leon River, with installation to comprise two 3000-kw. generators and auxiliary machinery.

The Southern Motor Mfg. Association, Beatty Building, Houston, manufacturer of motor trucks, is planning for the erection of two new units at its plant. James E. Belvins is president.

The Peerless Oil & Refining Co., Quarrier Street, Charleston, W. Va., is considering plans for the erection of a new refinery at Burkburnett, Tex., to cost about $150,000.

The Wichita Falls Motor Co., Wichita Falls, Tex., manufacture of motor trucks, has increased its capital stock from $800,000 to $1,800,000.

California

LOS ANGELES, Feb. 24.

The National Axle Co., Chamber of Commerce, San Jose, Cal., has plans under way for the first unit of its new plant at Luna Park, vicinity of Seventeenth Street, to cost about $60,000. J. G. Travares, formerly head of the Noiseless Typewriter Co., is president, and J. L. Armstrong, formerly general superintendent of the Wisconsin Axle Co., will act in a similar capacity for the new organization.

The International Aircraft Corporation, Los Angeles, has been incorporated with a capital of $250,000 by W. T. Kendrick, Jr., George F. Rankin and J. Whitten Hicks, to manufacture airplanes, motors and parts.

The Alameda Sugar Co., 310 Sansom Street, San Francisco, is planning for the erection of a new refining plant near Meridian, Cal., to cost about $1,000,000, including machinery.

Kleiber & Co., 1480 Folsom Street, San Francisco, will build a one-story brick and steel machine shop at Folsom and Jupiter Streets to cost about $18,000.

The Red River Lumber Co., Westwood, Cal., is planning for the erection of a hydroelectric power plant on Clear Creek with initial capacity of about 5000 hp..

The Grand Central Garage Co., Los Angeles, has plans for the erection of an eight-story service building and repair works, 168 x 180 ft., at Fifth Street and Grand Avenue, to cost about $400,000. J. T. Cooper and George I. Cochran head the company.

The Woodward Way Mfg. Co., Sacramento, Cal., recently organized, is arranging for the establishment of a local plant for the manufacture of sheet metal specialties and electrical products.

The Guaranteed Magneto Parts Co., 2025 West Pico Street, Los Angeles, has filed notice of organization to manufacture automobile and electrical specialties. D. N. Marshank, 825½ South Burlington Avenue, heads the company.

The Los Angeles Trunk Hardware Co., Los Angeles, has been incorporated with a capital of $50,000 by Philip Senegram, M. I. Philips and J. H. Jaffe, to manufacture hardware and metal specialties.

A new cold storage and refrigerating plant to cost about $200,000, including machinery, will be erected by the National Ice & Cold Storage Co., Second and Market streets, Oakland, Cal.

The Burbank Motor Co., Marsh-Strong Building, Los Angeles, is having plans prepared for new works comprising three one-story shops, 50 x 145 ft., to cost about $125,000, at Burbank. F. R. Dorn, Marsh-Strong Building, is architect.

Canada

TORONTO, March 1.

The Canadian Car & Foundry Co., Montreal, has received orders for approximately $12,000,000 worth of railroad equipment placed by railroads in the Dominion. Of the new business about $5,000,000 is from the Canadian Pacific Railway Co., covering the building of freight cars, while orders involving approximately $7,000,000 for freight and passenger car equipment have been awarded by the Canadian National Railway system. The company now has on its books business aggregating almost $20,000,000, with prospects of further orders of substantial magnitude. Exclusive of these, however, the demand for castings and other car building accessories from the United States has assumed considerable proportions, the company's Brantford, Ont., plant in particular benefiting from this inquiry.

The Tube Co. of Canada, Ltd., has obtained premises at 233 Dufferin Street, Toronto, and will manufacture welded steel tubing ranging from ⅜-in. to 2-in. outside diameter and thickness of 14 to 20 gage. The capacity of the plant will be 30,000 ft. per day, hot or cold finish, and the equipment will consist entirely of automatic welding machines. The officers are W. W. Carter, president; P. Sorley, secretary-treasurer, and J. F. Lawson, vice-president and general manager.

The Machinery & Foundries, Ltd., recently incorporated with a capital stock of $250,000, will start operations in the spring on the erection of a plant on the Murray property just east of the town of Brockville, Ont.

The Canadian Locomotive Co., Kingston, Ont., has received orders for locomotives which will keep its works operating until well into 1921. The orders total 33 engines, 20 of which are for the Canadian National Railways, 3 for the British Columbia Government for the Pacific and Southeastern Railway and 10 for the Jamaican Government.

David Bradley, secretary-treasurer of Radville, Sask., is in the market for a suction gas producer and engine of 75 to 100 hp., for installation in an electric plant about to be erected.

G. S. Pettapiece, managing director of George Cradock & Co., B. C., Ltd., has purchased nine acres at the corner of Seventeenth Avenue and Yew Street, Vancouver, B. C., on behalf of George Cradock & Co., Ltd., Wakefield, England, for the erection of a plant for the manufacture of wire rope, steel cables, etc., to take care of domestic business and trade with the Orient. One of the parent company's engineers is on his way to Vancouver from England to superintend construction, which will be started at once.

W. O. Goffatt & Co., 12 King Street East, Toronto, agents for the Peace River Petroleum, Ltd., Peace River, Alta., are asking for prices on mining machinery and equipment.

The Administrative Commission, Montreal, will purchase two electric pumps for its water works system to have a daily capacity of 30,000,000 gal.

The official liquidator, G. T. Clarkson, has received permission from Justice Middleton to advertise the works of the Polson Iron Co., Toronto, for sale. The contracts the company had on hand were all completed.

W. F. Hamlyn, Belmont, Ont., is in the market for sawmill equipment, including one 14 x 16-in. or 16 x 18-in. slide valve modern type engine; one 12 x 12 or 12 x 14-in. slide valve modern type engine; one locomotive boiler, 50 to 60 hp.; one log jack loader; one heavy steel carriage, with or without gunshot feed; one line of live rolls, gear drive.

The Windsor Petroleum & Refining Co., Ltd., 423 Drummond Building, Montreal, is in the market for two 175-hp. tubular return boilers, with grates and fittings, and Ontario boiler inspection certificate to withstand pressure of 125 lb.; one second hand vertical boiler, 10 to 15 hp., equipped with two ejectors and small stack; one Smith concrete mixer, 1/3 to ½-cu. yd. capacity, direct connected to boiler and equipped with power loader and tank mounted on all-steel frames with hauling pole.

The St. Marys Wood Specialty Co., Ltd., St. Marys, Ont., is in the market for a portable forge, preferable for oil burning.

A. Homme, Sons & Co., Ltd., Elmira, Ont., has been incorporated with a capital stock of $100,000 by August Home, McKillop, Ont.; John Benneuris and George Hillebrecht, Logan, Ont., and others to manufacture machinery, implements, tools, etc.

The Porcupine Pulp & Lumber Co., Hoyle, Ont., is in the market for one 16 x 22 slide valve steam engine.

W. A. Moore, Clerk, Perth, Ont., is asking for prices on two complete new crushers for the Lanark County Council.

The Elgin County Council, E. W. McKay, St. Thomas, Ont., clerk, is in the market for crushers and rollers.

The London & Port Stanley Railway, Colborne Street, London, Ont., is receiving prices on six locomotive coaches and one electric locomotive. Philip Pocock is chairman.

The Ontario Spring Bed Co., King Street, London, Ont., is having plans prepared by L. G. Bridgeman, Bank of Commerce Building, for the erection of an addition to cost $10,000.

The Sangamo Electric Co., 183 George Street, is having plans prepared by B. H. Prack, 50 Bay Street, Toronto, for the erection of an addition to its plant.

The Canada Metal Co., Ltd., Fraser Avenue, Toronto, has purchased the building of the United Brass & Lead Co., 284 St. Helens Avenue, and will use it as a subsidiary to the main plant on Fraser Avenue. It is also having plans prepared by F. S. Mallory, 65 Adelaide Street East, for an addition to its plant on Fraser Avenue.

The Republic Stamping & Enameling Co., Canton, Ohio, has secured controlling interest in the Consolidated Stamping & Enameling Co., 2382 Dundas Street West, Toronto, and will start work about March 15 on the erection of an addition to the plant. New equipment will also be installed.

The Pacific Northwest

SEATTLE, Feb. 24.

Foundry and machine shops are operating at capacity, notwithstanding the practical cessation of activities in steel shipbuilding plants in this district. Shops engaged in the manufacture of automobile parts or accessories are rushed with orders and several have enlarged their manufacturing space to meet the increasing demands. Sawmill equipment is active, and the call for canning machinery has set new records. Second-hand equipment has been moving exceptionally well, due to the scarcity and high prices of new machines.

The Palmolive Co., whose plant in Portland, Ore., was recently destroyed by fire, will rebuild in Oakland, Cal. The new structure will cost $350,000 and the equipment $150,000.

The Hedlund Lumber Co., Spokane, plans the equipment of a plant to have a daily capacity of 50,000 ft. A single-band mill will be built.

The Peninsula Lumber Co., Portland, plans to double the present capacity of its mill, at a cost of several hundred thousand dollars. F. C. Knapp, president.

Charles J. Schnabel, engineer, Portland, has filed application for the development of a light and power plant on the Santiam River. The project includes the development of 6511 hp. at a cost of $800,000.

The Parmelee Boiler Co., Seattle, has purchased the plant of the Elliott Bay Dry Dock Co., which it will operate under the name of the Seattle Dry Dock, Inc. The works will be completely overhauled, and new equipment installed. The new company will specialize in repair work on small boats.

The Spokane & International Railroad Co., Spokane, will expend more than $50,000 in additions and improvements to its local yards and shops. A coaling plant costing $25,000 will be installed.

The British-American Mill Co., Bellingham, Wash., has been organized with a capital stock of $100,000 by John Troxell and Thomas R. Waters and will erect a plant for the manufacture of shingles, ties and siding.

J. J. Sticklin, Centralia, Wash., will establish a lath mill with a daily capacity of 100,000. The plant will also be equipped to manufacture wooden novelties and will cost about $30,000.

J. W. Akin, Stanwood, Wash., plans the establishment of a foundry and machine shop, the main structure to be 50 x 100 ft. It will specialize in marine repair work.

L. H. Williams, Seattle, will construct a small plant at 628 West Canal Street for repairing fishing vessels. It will be 92 x 97 ft., and will cost about $5,000, exclusive of equipment.

The Brace & Hergert Mill Co., Seattle, plans the construction of a heavy timbered planing mill at 825 Terry Avenue North. It will be 50 x 143 ft., and will house new machinery throughout and cost about $10,000.

The Tachenitch Timber Co., Marshfield, Ore., will erect in the near future a sawmill with a daily capacity of 60,000 ft.

The Wenatchee Valley Gas & Electric Co., Wenatchee, Wash., will build a new steam generating station with a capacity of 1000 hp. and to cost $90,000.

The Pacific Coast Steel Co., Seattle, will immediately erect a one-story concrete addition to its power house, at a cost of about $5,000.

The British Columbia Marine Ways, Ltd., Vancouver, B. C., has increased its capital stock to $1,000,000 and plans immediate alteration to its plant. Provisions will be made for larger ships and the repair department will be extended.

The Royal Crown Soap Co., Vancouver, B. C., controlled by Lord Leverhulme, has purchased a $200,000 site in Vancouver on which an extensive plant will be built. A wharf accommodating ocean carriers will be built for its export trade.

Government Purchases

WASHINGTON, March 1.

Bids will be received by the bureau of supplies and accounts, Navy Department, Washington, for supplies for the naval service as follows: Schedule 5663, 1 scarfing machine for Brooklyn, opening March 16; schedule 5671, 1 gap lathe for Philadelphia opening March 9; schedule 5672, 4 valve-reseating outfits for Philadelphia opening March 9; schedule 5688, 9 induction motors for Newport, opening March 12; schedule 5692, four engine lathes, opening March 16.

The United States Civil Service Commission announces competitive examinations for the following positions: Foreman, heat treatment of armor plate, $10 to $14.40 a day; foreman, heat treatment of large guns, $8 to $12.56 a day. Applicants should apply for form 1371, stating the title of examination desired, to the secretary of the Fourth Civil Service District, Washington.

BOOK REVIEWS

Theory and Practice of International Commerce. By Archibald J. Wolfe. Pages 548, 5¾ x 8½ in. Published by International Book Publishing Co., London and New York.

The book assumes a previous knowledge of the "A B C" of exporting and importing, such as export routine, qualifications of salesmen, packing methods, etc. According to its foreword, "In its theoretical portion it aims to supply the teachers and the students in American colleges with a logically built up course of instruction, and the business world at large with an exposition of those economic principles which are responsible for the development of modern methods in exporting and importing, for the evolution of the present-day sales machinery in international commerce, and for the establishment of that vast body of unwritten commercial law known as 'commercial usage.' The present volume adopts the plan of a detailed analysis of a few selected practical problems in which a changed outlook, due to the developments of recent years, calls for a thorough presentation."

The problems include foreign credits, the evolution of modern banking facilities, commercial laws and regulations affecting incorporations abroad, the value and correct use of sources of information at home and abroad, the proper sphere and development of official and associational trade promotion and the rational methods of modern publicity. Methods of German foreign trade operations and British banking organizations are minutely portrayed.

The Law of Government Contracts. By R. Preston Shealey. Pages 300, 5½ x 8½ in. Published by the Ronald Press Co., New York.

This is a new manual for the lawyer, manufacturer, contractor, credit man, engineer, accountant and other executive, and is a particularly timely book in view of the many war contracts between the United States Government and private concerns and their many difficulties of adjustment. The author is a member of the bar of the Supreme Court of the United States. According to him, there are nearly 100,000 corporations and firms interested in Government contracts. The book has been "so written and compiled as to be of service not only to the trained lawyer but also to the intelligent business man." As in all law books, there are references to cases forming precedents. In the appendix are lists of "practical suggestions," Governmental purchasing officers and agencies, Governmental disbursing officers and agencies and statutes relating to contracts with the United States.

How to Make and Use Graphic Charts. By Allen C. Haskell. Pages, 540, 6 x 9 in.; illustrations, 515. Published by Codex Book Co., 19 William Street, New York.

Business executives, personnel managers, engineers and writers will find the book by Allen C. Haskell, principal assistant engineer of the Construction Service Co., a handy guide. The author has compiled from the best of preceding books on this subject and has made a number of valuable additions in arrangement and content. Especial emphasis is laid on the possibilities of trilinear charts, a convenient form of graphic depiction which has been slightly used in this country. The book is well arranged either for the lay reader or the experienced engineer. It starts with the fundamentals of graph drawing and tells the sophisticated student what he may skip so that he may lose no time in wading through what he already knows.

The author describes various types of charts such as rectilinear, logarithmic, semi-logarithmic, polar, isometric and nomographic and devotes a particularly useful chapter to the discussion of trilinear charts.

The greater part of the book is devoted to showing the practical application of graphic representation to various business and engineering uses. It shows how the graphs may be useful to depict clearly and briefly fluctuation of profits in a business, the variations in sales efficiency and labor turnover. It shows the use of charts for arithmetical and geometrical computation and indicates how they may be used as an aid to designing and estimating. The strength of the book is not in originality of forms but rather in showing how established methods may be developed and used to the full. It contains a number of valuable cautions against graphic misrepresentation pointing out where semi-logarithmic charts are essential and indicating the dangers of charts which make two-dimension rather than linear comparisons.

Heaton's Annual—Commercial Handbook of Canada. Sixteenth edition, 1920. Pages 550, 4½ x 7½ in. Published by Heaton's Agency, 32 Church Street, Toronto, Can.

Features of this handbook are facts concerning the Canadian customs tariff, descriptions of industrial opportunities of cities and towns of commercial importance, shippers' guide, a section on natural resources, financial and general information, directories of Government officials and departments. The book is intended for both office and home use and is larger by 40 pages than last year.

The Chemical Catalog Co., Inc., 1 Madison Avenue, New York, has completed arrangements for the publication of a handbook or a compendium of quantitative analytical chemistry. The author is a member of the faculty of one of the universities devoting special attention to chemistry, and has had extensive experience in applied chemistry and in chemical engineering. It is planned to include every method given in chemical literature, both in English and in foreign languages. The work will be in two volumes, one inorganic and the other organic. The inorganic volume will be published first. Every journal and book likely to contain methods of quantitative analysis will be carefully searched. The material will be thoroughly indexed, not only under the elements and compounds, but also under the commercial articles in which the element is to be determined. Copious references to the original literature will be given. The author will be assisted by the editorial staff of the Chemical Engineering Catalog and a clerical force.

"Theory and Practice—Outlines of Instruction in Related Subjects for the Machinist's Trade" is the subject of bulletin No. 52, issued by the Federal Board for Vocational Education, Washington. The booklet presents and discusses various questions concerning the teaching of related subjects content as it affects trade preparatory and trade extension instruction in evening, part-time, or all-day trade or industrial schools. The manuscript includes an analysis of the machinist's trade and of general trade subjects, suggestions on the organization of material and methods of instruction, and a suggested part-time four-year apprentice program. While the bulletin is of value to those responsible for the administration of trade and industrial schools, it is specifically directed toward instructors and instructor-trainers as an aid in the determination of the content of instruction.

The proceedings of the American Society for Testing Materials, covering the meeting held in Atlantic City in June, 1919, are published in two volumes. Part I gives the committee reports and the tentative standards, requiring a total of 800 pages, while Part II is given over altogether to the technical papers and the discussions following, and also has 800 pages. The society's headquarters are now at 1315 Spruce Street, Philadelphia.

A reprint of the Constitution of the United States in form of a 32-page booklet, illustrating by woodcuts at the top of alternate pages of Americans famous in Constitutional matters, and at the bottom with views about the plant of the Clark Equipment Co. at Buchanan, Mich., has been issued by that company.

NEW TRADE PUBLICATIONS

Saws and Saw Tools.—E. C. Atkins & Co., Indianapolis. Two catalogs, each No. 18, one with cloth cover, the other with flexible cover. Each catalog contains 264 pages, 7 x 10 in., and is devoted to saws and saw tools, including an extensive line of mill, metal and cross cut saws; ice, hand, mitre box, compass and keyhole, and pattern makers' saws, etc.; floor, bench, wall and belt scrapers; swages, saw vises, clamps and sets, saw fitting tools, hammers, straight edges, gummers, grinders, grinding wheels, brazing outfits, mandrels, car movers, belt punches, trowels, machine knives and a line of saws and tools for manual training schools. The catalogs are profusely illustrated.

Planers.—Liberty Machine Tool Co., Hamilton, Ohio. Two catalogs, one illustrating and describing a line of constant and variable speed planers, the other devoted to a line of open side planers. A patented feed is emphasized as a feature of these machines.

Condensing Apparatus.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Catalog W-701, 115 pages, 6 x 9 in. Illustrates and describes an extensive line of standard surface, high vacuum surface, jet and barometric condensers. Useful information on such subjects as condensation, calculation of condensing apparatus, vacuum pump capacity, comparison of the different types of vacuum pumps, and curves showing the relative comparison of surface and water for varying heat head and operating conditions, also curves showing the friction in surface condenser tubes, are included. Extensive low pressure steam tables and notes on the installation and operation of Worthington surface condensers are given.

Rails, Structural Steel, Bars, Tubes and Pipes, Brass and Copper Products, etc.—Viele, Blackwell & Buck, 49 Wall Street, New York. Eight bulletins. Bulletin 1 is devoted to rails and accessories, including such items as spikes, track bolts, portable track, switches, steel ties, dump cars and turntables; bulletin 2-A is concerned with structural steel and shows general details of the structural steel sections that are being rolled regularly by American mills; bulletin 3-A illustrates and describes an extensive line of iron and steel bars; bulletin 4 covers wrought steel and iron tubes and pipe, also fittings for steam, gas and water tubes; bulletin 5 gives specifications of the grades of steel plate in most frequent demand; bulletin 6 covers brass and copper products, such as seamless and brazed tubing, rods and wire in copper, brass and bronze; bulletin 7 is devoted to heavy chemicals which predominate in the American export trade; bulletin 10 covers extras and differentials on steel and iron products.

Helical Gears.—Fellows Gear Shaper Co., Springfield, Vt. Catalog, 43 pages, 6 x 9 in. Devoted to the application of helical or twisted teeth to gears operating on parallel axes, together with data on design, application and production. A scheme employing the Lewis formula for calculating the strength of helical gear teeth is dealt with briefly. The catalog is illustrated.

Reversible Ratchet Wrenches.—Lowell Wrench Co., Worcester, Mass. Catalog, 20 pages, 6 x 9 in. Illustrates and describes bridge builders', lag-screw, steel socket bridge, and multiple socket wrenches; also drilling posts, ratchet drills, ratchet die stocks, track drills, hand vises, reversible ratchet wrenches, etc.

Sprocket Chain.—Stowell Co., South Milwaukee, Wis. Catalog, 32 pages, 7 x 10 in. Devoted to malleable sprocket chain, including such kinds as standard detachable sprocket chain, plain pintle chain, sawmill pintle chain, roof chain and conveyor chain.

Boiler Feed Regulator.—Northern Equipment Co., Erie, Pa. Booklet with the title "Saving Fuel Automatically and Scientifically in the Boiler Room." The booklet compares hand and mechanical feeding with mechanical regulation, as performed by the Copes regulator. Numerous charts and diagrams are shown to emphasize the value of scientific control.

Centrifugal Pumps.—Dayton Dowd Co., Quincy, Ill. Three bulletins devoted to centrifugal pumps as follows: Bulletin 240, type CS single stage, double suction volute centrifugal pumps; bulletin 241, type CSU multi-stage centrifugal pumps, automatically balanced; bulletin 242, type SS single stage, single-suction centrifugal pumps. The bulletins are illustrated.

Portable Belt Conveyors.—Portable Machinery Co., Passaic, N. J. Bulletin. Illustrates and describes portable belt conveyors designed to handle a variety of material horizontally or at a slight incline. The machines are made with a belt 16 in. wide and in standard stock sizes ranging from 12 ft. 6 in. to 37 ft.

Chucks and Chucking.—Smalley General Co., Inc., Bay City, Mich. Bulletin. Treats of different methods of chucking, and chucks in use on Smalley General thread millers.

Special Tools for Ford Repair Shops.—K. R. Wilson, 10 Lock Street, Buffalo. Catalog. Illustrates and describes an extensive line of special tools for Ford repair shops.

Incinerators.—Washburn & Granger, Inc., 50 Church Street, New York. Catalog 9. Concerned with incinerators for the sanitary disposal of refuse by factories and public buildings. The Dean flat suspended furnace arch to be used for high temperature incinerators and Dean dumping grates and Dean shaking grates are also described.

Air Valves for Steam Heating Systems.—Hoffman Specialty Co., Inc., 512 Fifth Avenue, New York. Booklet with the title "Guaranteeing Air Valves for Steam Heating Systems, as Recommended by J. F. Musselman." Illustrates and describes a return line valve for vapor, vapor vacuum, modulating and vacuum systems; a quick vent air valve, and quick vent float air valve. A facsimile of a guarantee form supplied by the company with their valves and an explanation of the reasons for the form are included.

Carbon and Alloy Steels and Forgings.—Tacony Steel Co., Tacony, Philadelphia. Three folders, the first of a series of illustrated folders describing the company's facilities and products. The initial folder gives a bird's-eye view of the plant and lists the principal steels prdouced; the second booklet treats of the open hearth practice and the third booklet deals with the company's forge shops, organization, equipment and output of forgings.

Buckets.—Industrial Works, Bay City, Mich. Catalog 111. Illustrates and describes power wheel, multi-power and high power clam shell buckets, for use by railroads, steam plants, ore docks, smelters, etc., for handling coal, coke, ashes, ore, rocks, and similar materials.

Chains.—Columbus-McKinnon Chain Co., Columbus, Ohio. Catalog. Devoted to a line of chain which includes common or table chain; crane, sling and dredge chains; conveyor, block or wheel, steam shovel, coil and machine chains; automobile and truck chains, etc. Useful facts pertaining to chains are given.

Furnace Burners.—Hauck Mfg. Co., 126 Tenth Street, Brooklyn. Catalog. Describes and illustrates furnace burners and their uses. They are made in four designs of the atomizing, low pressure, positive pressure and vaporizing types. The first three types burn crude, fuel or kerosene oil and the fourth type burns kerosene or gasoline. The burners are used with brazing, tool dressing and rivet forges; bolt heating, annealing, case hardening, and crucible melting furnaces; and tinning baths.

Pyrometers.—Brown Instrument Co., Philadelphia. Catalog 12, 88 pages, 8 x 10½ in. Devoted to an extensive line of indicating and recording pyrometers for heat treating, at blast furnaces for measuring the temperature of the hot blast from the stoves and the temperature of the gases before entering the dust catcher, for testing the temperature of molten metal, for use in galvanizing and tinning, etc. Valuable information is included regarding resistance thermometers, recording thermometers, pressure gages, draft gages, tachometers, time and operation recorders and other instruments. The catalog is profusely illustrated.

Engineering Specialties.—Sherwood Mfg. Co., Buffalo. Catalog 18, 136 pages, 4¼ x 6½ in. Illustrates and describes a line of engineering specialties which include injectors, ejectors, strainers for injectors and ejectors, force sight-feed oil pumps, hand cylinder oil pumps, sight-feed cylinder lubricators, oil cups, oil gages, lubricating devices, oiling devices, grease cups, flue cleaners, steam hose, high pressure valves for CO_2 cylinders and for oxygen cylinders. The catalog is illustrated.

Steam Shovels, Crawling Traction Trucks, Dragline Excavators, etc.—Marion Steam Shovel Co., Marion, Ohio. Bulletin 21, 64 pages, 5½ x 8 in. Descriptions and illustrations of railroad type shovels, small revolving shovels, crawling traction trucks, dragline excavators, dipper dredges, placer-elevator dredges, hydraulic dredges, railroad ditchers, ballast unloaders, log loaders, etc.

Rolling Mills.—Standard Machinery Co., Auburn, R. I. Catalog, 65 pages, 6 x9 in. Devoted to an extensive line of rolling mills. These include rolling mills with friction clutch drive and with plain bearings or roller bearings, three-high rolling mill with friction clutch drive, spoon grading and cross rolling mills, wire flattening mills, and collapsible type reels. A number of pages are devoted to special mills and special applications of the company's regular mills. The catalog is illustrated.

Furnaces for Treating Steel.—Bellevue Industrial Furnace Co., Detroit. Catalog 4, 88 pages, 9 x 12 in. Lists and illustrates stock sizes of furnaces and accessories designed to supply standard equipment for all methods of metal heat-treating. The line covered affords considerable latitude in the selection of different types and dimensions of furnaces. The furnaces are adapted for oil or for gas according to the class of work for which they are intended.

Metal Working Machinery.—Allied Machinery Company of America, 51 Chambers Street, New York. Catalog of metal working machinery. Section 15201 is devoted to a line of milling machines of the horizontal type and of the vertical type manufactured by Kearney & Trecker Co., Milwaukee; section 12202 illustrates and describes a line of high duty shapers and bevel gear roughing shapers manufactured by Gould & Eberhardt, Newark, N. J.; section 13601 covers multiple spindle vertical turret drilling machines of the automatic or hand feed type manufactured by Turner Machine Co., Danbury, Conn.; section 16301 covers disk grinding machines of single and double spindle types for the finishing of flat surfaces, and roll grinding machines for cylindrical work manufactured by Gardner Machine Co., Beloit, Wis.

Gas Producers.—Akerlund & Semmes, Inc., 17 Battery Place, New York. Catalog, 39 pages, 6 x 9 in. Illustrates and describes three types of gas producers as follows: Type A of the suction updraft type delivering gas for power and furnace purposes and for operation on anthracite coal, charcoal and coke; type B of the suction downdraft type, delivering gas for power or furnace purposes from bituminous coal, semi-bituminous coal or lignite; also a gas generator of the foregoing type of increased diameter known as type B-w for operating on wood and wood refuse; type F of the suction updraft type, delivering a hot unwashed gas from bituminous coal, semi-bituminous coal, lignite, or wood for furnace purposes.

Car Dumpers.—Wellman-Seaver-Morgan Co., Cleveland. Bulletin 49. Blue prints, illustrations and descriptions of car dumpers employed for discharging the contents of open top railroad cars by inverting the car sidewise and dumping the contents into boats, bins or storage yards.

Textile Machinery.—Saco-Lowell Shops, Boston. Catalog, 691 pages, 4¾ x 6¾ in. Lists and illustrates an extensive line of cotton mill equipment, also gives drawings of various machines for the benefit of engineers, as well as shipping weights, belting lists and much other miscellaneous data.

Interchangeable Counterbores.—Eclipse Interchangeable Counterbore Co., Detroit. Catalog. Illustrates and describes interchangeable counterbores and interchangeable core drills, reamers, counterbore cutters, spot facers and countersinks. Standard, adjustable length, straight shank and combination safety holders are also described.

Calendar.—Nagle Steel Co., Pottstown, Pa. Consists of 12 sheets, 17 x 22 in., each showing a three months' calendar. A view of the Glasgow works of the company is shown at the top of each sheet.

Calendar.—Shoemaker-Satterthwait Bridge Co., 256 Broadway, New York. There are 12 sheets, 12½ x 39 in., each showing a three months' calendar. At the top of the sheets are shown views of buildings, bridge, coaling station, coke plant, etc., built by this company.

Machine Tools.—Pedrick Tool & Machine Co., 3640 North Lawrence Street, Philadelphia. Catalog, 96 pages, 7½ x 10½ in. Illustrates and describes machinery for use in railroad shops, ship yards, general machine shops, and miscellaneous industrial plants. The tools described include cylinder, Corliss valve, oil engine, lathe, floor plate and universal boring bars; combination floor plate and cylinder bar, column boring machines, portable crank pin turning machine, driving box planer tool, duplex horizontal boring machine, facing arm, portable floor boring machine, portable milling machine, pipe bending machines; taper boring, trepanning, tube boring, turning and universal boring machines, and V frame portable bar.

Water Tube Boilers.—Springfield Boiler Co., Springfield, Ill. Catalog, 24 pages, 8½ x 11 in. Descriptions, blueprints and views of water tube boilers built in unit sizes to 2000 hp. and for working pressure to 500 lb. The boilers are of all steel construction and are made without stay bolts, bent tubes, rods or braces, the sections being individually suspended. The blue prints show the boilers equipped for hand firing, equipped with overfeed type stoker and superheater, arranged to burn fuel oil, equipped with side feed type stoker, underfeed type stoker and superheater, chain grate stoker, Dutch oven, etc.

Power Hammers.—Beaudry & Co., Inc., 141 Milk Street, Boston. Catalog. Concerned with power hammers, built in two styles, belt and motor driven, in sizes from 50 to 500 lb. weight of ram. They are designed for light and heavy railroad, machine, and general blacksmithing; for swaging, collaring, drawing, and general manufacturing.

Electric Space Heaters.—Cutler-Hammer Mfg. Co., Milwaukee. Two folders. A small folder describes an electric space heater which consists of a ribbon of nichrome steel resistor incased in sheet mica and mounted on a steel strip, all inclosed in a steel jacket. The heaters are flat like an ordinary ruler, 2 ft. long, 3/16 in. thick and 1½ in. wide. Each heater has a capacity of 500 watts. The larger folder reproduces current advertisements on the space heater and includes a list of publications in which the advertisements are appearing.

Woodworker's Vise.—Oliver Machinery Co., Grand Rapids, Mich. Folder. Illustrates and explains the use of a universal vise for woodworkers and patternmakers.

Milling Machines.—Ingersoll Milling Machine Co., Rockford, Ill. Leaflet. Portrays and explains the milling of quad truck axles on the company's fixed rail milling machine fitted with two vertical heads of two spindles each. One page is devoted to a machine for grinding face milling cutters.

Optical Pyrometers.—Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia. Catalog 86-B. Concerned with an optical pyrometer, a portable instrument for works temperature measurements. Applications described include gaging temperatures in the open, in fuel beds, in heat-treating furnaces, in muffle furnaces, in the rolling and forging of steel, in blast furnaces, in electric furnaces, of molten steel and slag, of molten cast iron, of molten non-ferrous metals, etc., and for checking thermocouple pyrometers.

Mechanical Hot Blast Heater.—Robert Gordon, Inc., 622 West Monroe Street, Chicago. Catalog. Concerned with a portable, fan actuated, mechanical hot blast heater for heating large or small buildings, foundries, factories, etc. It burns bituminous or anthracite coal or coke.

Electrical Equipment for the Chemical Industries.—General Electric Co., Schenectady, N. Y. Booklet, with the title, "The Electrification of Chemical Industries." Shows illustrations and describes applications of motor-driven conveyors, generators, switchboards, motor-driven pumps, control boards, steam turbo generators, motor-driven gas compressors, electric locomotives, ultra-violet ray apparatus, electric heating units for enamel baking ovens and other applications of electrical equipment in the chemical industries.

Screw Jacks.—Duff Mfg. Co., Pittsburgh. Leaflet. Concerned with a high speed, ball-bearing screw jack of 75-ton capacity, especially adapted for handling locomotives and other heavy railway equipment.

Tile and Terrazzo for Floor Coverings.—Norton Co., Worcester, Mass. Booklet. Discusses alundum tile and terrazzo aggregates for walking surfaces for stairs, ramps, floors, elevators, elevator landings, shower baths and pools. The booklet is illustrated. Another booklet of 18 pages gives the results of tests of alundum tile made at Columbia University for the purpose of determining those physical properties which are of importance in connection with its use as a stair tread, either for inlaid or unit construction.

Shipyard Angle and Plate Heating Furnaces.—W. S. Rockwell Co., 50 Church Street, New York. Leaflet 206. Illustrates and describes angle and plate heating furnaces for the shipyard. The burners use oil or gas or both fuels may be used simultaneously.

Drop Forgings.—Union Switch & Signal Co., Swissvale, Pa. Bulletin 96. Illustrations and details of typical drop forgings which the company are prepared to furnish for automobile, aeroplane, tractor, truck, railroad and general use.

Pots and Boxes for Carbonizing and Annealing.—Quigley Furnace Specialties Co., 26 Cortlandt Street, New York. Folder. Explains the service which the company is prepared to furnish on the manufacture and use of pots and boxes for carbonizing and annealing.

Mills and Mixers.—Charles Ross & Son Co., 148 Classon Avenue, Brooklyn. Booklet. Announces the company's fiftieth anniversary and shows title pages, reduced, of circulars now in issue, illustrating and describing the company's line of mills and mixers.

Broaching Machines.—American Broach & Machine Co., Ann Arbor, Mich. Catalog. Illustrates and describes the company's No. 1½ broaching machine.

Ballast Cleaner.—Link-Belt Co., 910 South Michigan Avenue, Chicago. Folder. Illustrates and describes the Pratt ballast cleaner, a machine for mechanically screening dirt out of stone ballast between railroad tracks. It is operated by a 3-hp. gasoline engine and is so constructed that trains can pass on either track while the machine is operating.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	4.50c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 4.25c.
1 to 6 in. x ⅜ to 1 in	3.52c. to 4.25c.
1 to 6 in. x ¼ to 5/16	3.62c. to 4.35c.
Rods—⅝ and 11/16	3.57c. to 4.05c.
Bands—1½ to 6 by 3/16 to No. 8	4.22c. to 5.25c.
Hoops	4.47c. to 5.50c.
Shapes:	
Beams and channels—3 to 15 in	3.47c. to 4.25c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 4.25c.
3 in. x 3/16 in. and ⅛ in	3.72c. to 4.60c.
1½ to 2½ in. x ⅛ in	3.52c. to 4.40c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 4.35c.
1 to 1¼ in. x 3/16 in	3.52c. to 4.40c.
1 to 1¼ x ⅛ in	3.57c. to 4.45c.
⅞ x ⅞ x ⅛ in	3.62c. to 4.50c.
¾ x ⅛ in	3.67c. to 4.55c.
⅝ x ⅛ in	4.07c. to 5.35c.
½ x 3/32 in	5.17c. to 6.05c.
Tees:	
1 x ⅛ in	3.87c to 4.75c.
1¼ in. x 1¼ x 3/16 in	3.77c. to 4.65c.
1½ to 2½ x 3/16 in. and thicker	3.57c. to 4.45c.
3 in. and larger	3.52c. to 4.30c.

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.52c. to 4.25c.
Toe calk, ½ x ⅝ in. and larger	4.60c. to 4.85c.
Open-hearth spring steel	7.00c.
Standard cast steel, base price	14.00c.
Extra cast steel	18.00 to 20.00c.
Special cast steel	23.00 to 25.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c. to 4.50c.

Sheets

Blue Annealed

	Per lb.
No. 10	5.07c. to 6.25c.
No. 12	5.12c. to 6.30c.
No. 14	5.42c. to 6.35c.
No. 16	5.52c. to 6.45c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	6.80c. to 8.80c.	
Nos. 22 and 24	6.85c. to 8.85c.	9.80c.
No. 26	6.90c. to 8.90c.	9.85c.
No. 28	7.00c. to 9.00c.	10.00c.
No. 30	7.10c. to 9.10c.	

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	7.25c. to 9.00c.
No. 16	7.50c. to 9.25c.
Nos. 18 and 20	7.65c. to 9.40c.
Nos. 22 and 24	7.80c. to 9.55c.
No. 26	7.95c. to 9.70c.
No. 27	8.10c. to 9.85c.
No. 28	8.25c. to 10.00c.
No. 30	8.75c. to 10.50c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
⅛ in. Butt...	—36	—19	¼-1½ in. Butt.	—18	+2
¼-3 in. Butt.	—40	—24	2 in. Lap.....	— 9	+9
3½-6 in. Lap.	—35	—20	2½-6 in. Lap..	—11	+6
7-12 in. Lap..	—25	— 8	7-12 in. Lap...	+ 2	+20

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per lb.
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	28¼c. to 29½c.
High Brass Wire	28¼c. to 29½c.
Brass Rod	26¾c. to 29 c.
Brass Tube	42½c. to 44½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29½c. per lb. base.
Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$15.00	$13.00
IX	17.25	15.00
IXX	19.00	16.75
IXXX	20.75	18.50
IXXXX	22.25	20.25

Coke—14x20	Primes	Wasters
80 lb.	$9.80	$9.55
90 lb.	9.90	9.65
100 lb.	10.00	9.75
IC	10.25	10.00
IX	11.25	11.00
IXX	12.25	12.00
IXXX	13.25	13.00
IXXXX	14.25	14.00

Terne Plates

8-lb Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	64c.
Bar	70c. to 80c.

Copper

Lake ingot	21c. to 22c.
Electrolytic	20c. to 21c.
Casting	19½c. to 20c.

Spelter and Sheet Zinc

Western spelter	10½c. to 11½c
Sheet zinc, No. 9 base, casks	14c. open 14½c.

Lead and Solder*

American pig lead	10c. to 11c.
Bar lead	11c. to 11½c.
Solder ½ and ½ guaranteed	43c.
No. 1 solder	40c.
Refined solder	36c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	90c.
Commercial grade, per lb	50c.

Antimony

Asiatic	12¾c. to 13½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb...35c. to 38c.

Old Metals

The market was uncertain last week and not much business was transacted. Lead prices responded upward in sympathy with new metal. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	16.75
Copper, heavy and wire	16.00
Copper, light and bottoms	14.50
Brass, heavy	10.50
Brass, light	7.75
Heavy machine composition	15.75
No. 1 yellow brass turnings	9.75
No. 1 red brass or composition turnings	12.75
Lead, heavy	7.50
Lead, tea	5.00
Zinc	5.25